

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York.

Vol. XXII: No. 3.

New York, Thursday, July 18, 1878.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## Chauvin and Marin-Darbel's Testing Machines.

In the various constructive branches of engineering and architecture the necessity of as close an economy in the use of materials as is compatible with safety has naturally led to a more profound and searching inquiry into the resistance of materials to strains varying in their nature. The demand for metal, &c., possessing a certain given resistance has become universal, so that in their efforts to meet the requirements producers, as well as large consumers, are obliged to provide themselves with the apparatus necessary for testing their material. The reliability and uniformity of the results obtained by these apparatus, though not yet complete, have nevertheless been enhanced considerably recently. In the accompanying illustrations, for which we are indebted to the *Revue Industrielle*, we show the latest styles of a well-known French firm, Messrs. Chauvin & Marin-Darbel. The principle upon which their machines is based is the action of atmospheric pressure upon a lower movable plate suspended from an upper one. The machine is composed of an inverted circular dish, fixed in the upper part of the machine. Within it a plate moves, which in its function is similar to a piston; a rubber membrane attached to it makes it airtight. The whole rests upon columns. In the center of the dish is an opening through which water may be introduced between it and the plate. When all the air has been expelled by the water flowing into this space the opening is closed by a plug. At the lower part of the space filled with water a U-tube enters, its other extremity being higher than the highest point of the dish. It is filled with mercury. As soon as the upper piston is drawn downward the effect will be to lower the column of mercury in the larger end of the tube and raise it in the shorter. A graduated scale measures this, indicating at once the total pressure and the amount per square inch. In the machines for testing the metals for tensile or compressive strains, shown in Fig. 1, the bit which holds the lower end of the test piece is drawn downward by a hydraulic press, so that the upper bit and its attachments act upon the upper movable plate, either directly or by a system of levers. The aspiration acts upon the column of mercury, the lowering of which is a measure of the force applied. As soon as the test is finished the discharge valve of the hydraulic press is opened. The piston of the press is then raised by means of the counterweight shown on the right hand in the illustration. The graduation of the scale is obtained by calculation, and may be controlled by directly suspending weights to the movable plate. Before every operation, according to the weight of the test pieces, the scale is so moved that the zero point corresponds to the level of the mercury. The large machine shown in the drawing has a capacity of 120,000 pounds; it is specially adapted for testing steel rails, &c., and has attachments for obtaining graphic tracings of elongation, compression and flexion. Fig. 2 shows a machine built for testing wire. A special instrument is made by Messrs. Chauvin & Marin-Darbel for observing elongation, &c., the arrangement of which will be seen from Fig. 3. By means of the two microscopes differences of 0.004 inch may be observed. A chief point of merit of these machines, besides their accuracy and the easy manipulation they permit, is the small space they occupy when compared with their power.

## Benjamin Haywood.

The Pottsville (Pa.) *Miner's Journal* pays the following tribute to the memory of the late Benjamin Haywood:

Benjamin Haywood, whose death occurred at 7 o'clock Tuesday morning, July 3, was born at Southwell, Nottinghamshire, England, Nov. 9, 1805. He was descended from a family of ironworkers, and at the age of 12 was apprenticed to a blacksmith, with whom he "served his time." At the age of 24 he concluded to try his fortune in the new world, and embarked for America August 31, 1829. Landing in New York, he first looked round for a job in that city, and finding none made his way to Philadelphia, and thence to Reading. At the last place he was advised to go to Pottsville, where he arrived in October. It was in 1829, during the wild excitement of the early mining days, when capital was flowing into the coal region, speculation was intense, business was done on high pressure principles, and labor was in demand. At first, however, the young emigrant found it difficult to procure employment, and complained years afterward that he had been compelled to forsake his trade and find work in a stone quarry. But this did not last long. In ten days he had looked over the field, found that there was a want of iron workers, rented an old shop in Port Carbon, and was hard at work at mine smithing. First he made and repaired wheels and axles, and then got to making cars. It was just the work that was needed and business flourished from the start. Two years later he was rich enough to go to Philadelphia and buy a steam engine for a machine shop which he then had in operation at Port Carbon. Bush & Muhlenberg, from whom he bought it, sent one of their men, named George W. Snyder, to Pottsville to put it up, and he liked the place so well that his Philadelphia employers soon had to find a

substitute for him. In 1835 was formed the copartnership of Haywood & Snyder, machinists and engine builders, at the Colliery Iron Works, the foundation of a large and successful business enterprise, which is still

Danville. They made the machinery for the Montour Iron Company, for the Phoenix Iron Company, and for a number of other large works. They made for the Montour Works the first set of rolls for rolling T rails

five years of California satisfied him with Western life. He disposed of his business in San Francisco, realizing a good price for it, and returned to Pottsville, where he was received by his old friends and workmen

the whole business and operated the mills in his own name. This was his work for the rest of his life. He kept his mills going through hard times and easy ones, and though after the crash in 1873 it cost him more to stack his rails in the yard than he could get for them delivered, he still kept his men at work. About two years ago, however, when the iron business was at its dulllest and prices most depressed, his men struck against a reduction of wages which the state of the business rendered absolutely necessary. This angered the old man. He considered it an act not only of injustice but of ingratitude. Weighed down by increasing age, struggling then with the disease which finally killed him, worn out by a life of hard work, he decided to stop. He told the men that he would have kept the mills open at his own expense for their sakes, but they had closed them themselves and they must take the consequences; he would never reopen them. And he never did. The men reconsidered their action, but it was too late; the decision was irrevocable. Nevertheless their old employer always remembered them with kindness, and on the Fourth of July just past he roused himself from the prostration of advancing death to give directions to his secretary concerning some of them to whom he had been in the habit of making presents on the Fourth of July and Christmas. It was characteristic of the man. Always firm and unyielding, always determined on having his own way, he was nevertheless both just and generous, and though the painful disease with which he suffered for years affected his temper in later life and made him at times fretful and perhaps unreasonable, the crustiness was only on the surface. Under it beat a heart which would not knowingly wrong his bitterest enemy, and which was quick to respond to any legitimate call for sympathy.

## Luck in Mining.

The Nevada *Transcript* tells the following story, which illustrates in a peculiar degree the uncertainties of gold mining on a small scale:

Some time about Good Friday last "Doc" Wilkinson closed up the fish-market that he had been running for several months in this city. Business had become so dull in his line that some days he did not sell enough fish to pay for the gas he burned while keeping open evenings. A few days after suspending operations here he went over to Auburn, Placer county, and, being a miner of considerable experience in early days, made arrangements with a man by the name of Pike to open up a ledge about three miles this side of Auburn which the latter owned, "Doc" agreeing to work the claim on shares. The above information is the last that "Doc's" friends have heard of him until day before yesterday. Mr. Wilkinson had been sinking the incline on the ledge, taking out the quartz as he went down, but leaving the footwall, so as to avoid having much cab or waste rock when he came to have a crushing. The quartz showed some free gold, but not being a very thick ledge, the "Doc" concluded to sink down to water level before taking his rock to mill. He had gone down to the incline about 60 feet, and while putting in a set of timbers a large chunk of the footwall fell out, disclosing to the eyes of the astonished miner another ledge behind the supposed foot wall, which was filled with gold. Of course further sinking was abandoned and attention directed to the new discovery. A force of men was immediately put to work on the newly discovered bonanza. Up to Wednesday morning \$20,000 worth had been raised to the surface, as was estimated by competent disinterested judges. In order to convince himself whether the rich ledge he had struck was only a pocket or not, Mr. Wilkinson went back up the incline a distance of 40 feet, and in half a dozen places where the cab was picked away from between the timbers, the same marvelously rich rock presented itself. Some of the few who have been permitted to go down into the incline say that over \$100,000 is already assured to the fortunate owners.

**Illinois Coal.**—Mr. William D. Rudy, of the Illinois Industrial University at Champaign, has just published a very interesting pamphlet on the coals of Illinois. In the introduction Mr. Rudy says: The coal area of the State of Illinois may be safely estimated, in round numbers, at 35,000 square miles, an area three times as large as that of Pennsylvania or Ohio, and constituting one fifth of the productive coal fields of the United States, not including what are termed the lignite basins of the Western territories. The coal measures of Illinois attain an aggregate thickness of 1400 feet, and may be divided into upper and lower measures, the latter of which, as a rule, contain the better coal.

**Silveroid.**—We learn that Brown Bros. are about introducing to the trade a new metal called "Silveroid," this name having already been registered at Washington. It has a fine texture, is susceptible of a high finish and can be supplied at much less cost than anything heretofore used as a substitute for real silver. Another point claimed in its favor is freedom from objections arising from corrosion where certain descriptions of metal have been used heretofore as table ware.

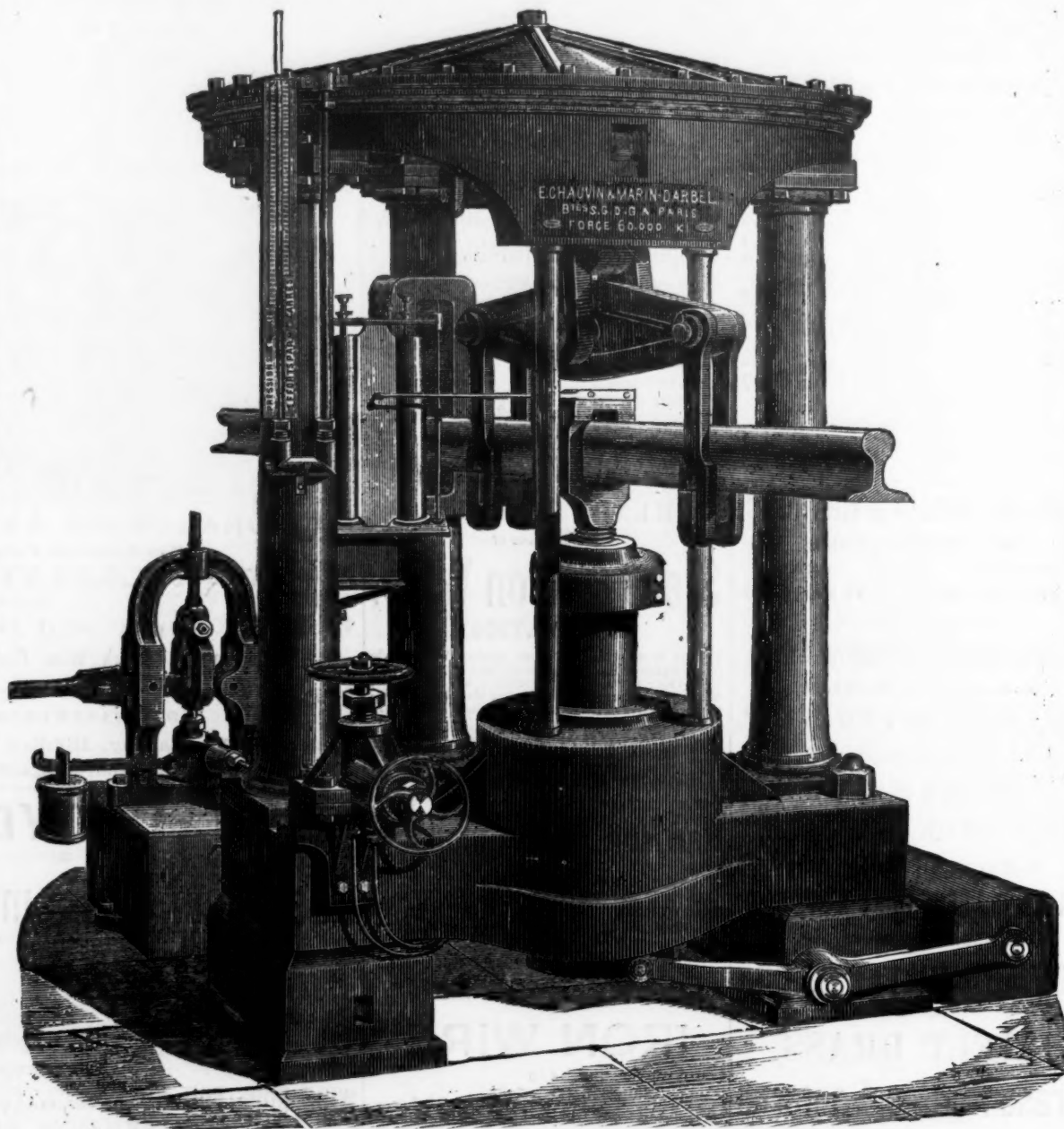


Fig. 1.—CHAUVIN AND MARIN-DARBEL'S TESTING MACHINE FOR RAILS, ETC.

in existence in the hands of the junior partner, and which has given employment to hundreds of workmen and taken a prominent part in the supplying of our collieries with

ever built in the United States, and also constructed the first machinery for sawing hot iron. At this time also Mr. Haywood was heavily interested in the coal business,

with a perfect ovation. They met him at the depot (Mount Carbon) and escorted him into town in a kind of triumphal procession. Determining to settle here, he purchased an

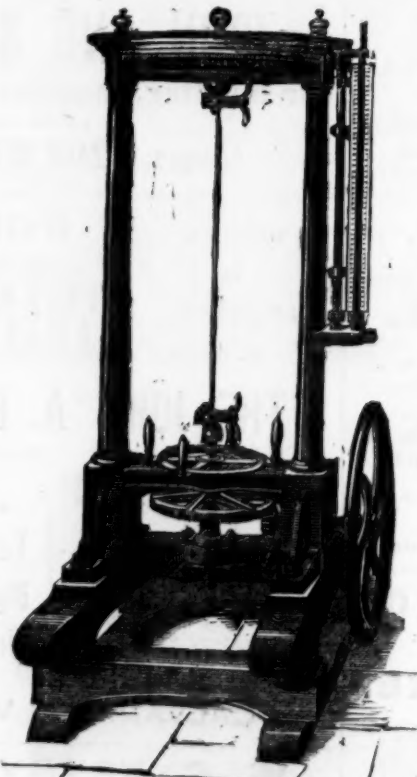


Fig. 2.—WIRE TESTING MACHINE

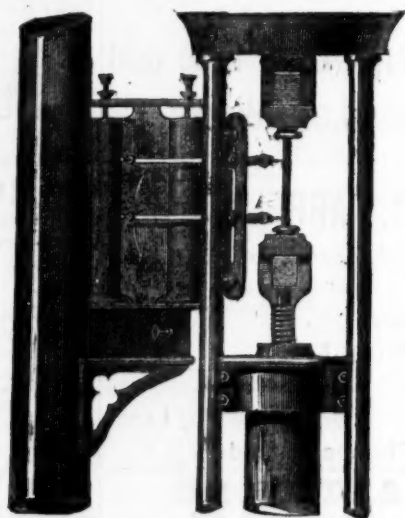


Fig. 3.—ELONGATION REGISTERING APPARATUS.

the large and important machinery used in their operations, as well as in erecting elsewhere some of the most massive machinery in the country. The same firm in 1845 erected a large machine shop and foundry at

as a member of the firm of Milnes, Haywood & Co. In 1850 the "California fever" seized Mr. Haywood, and he followed the rush of gold seekers to the new El Dorado. But

interest in the Palo Alto Rolling Mill, a small affair then compared with what it grew to be under his management. At first the firm was Haywood, Lee & Co., then Benjamin Haywood & Co., and finally he purchased



## Metals.

**ANSONIA  
BRASS & COPPER CO.,**  
19 and 21 Cliff Street.  
Adjoining Office of PHILPS, DODGE & CO.)

Sheet Brass, Sheet Copper, Copper Bottoms, Brass Wire, Copper Wire.

Planished Brass, Planished Copper, Copper Rivets & Burs, Braziers' and Bolt Copper, Braziers' Rivets, Copper Tubing, Iron Wire, Fence Wire, Seamless Brass & Copper Pipe.

**THE ANSONIA**  
Corrugated Stove Platform.  
SEE PAGE 9.

**Phelps, Dodge & Co.,**  
IMPORTERS OF

**TIN PLATE,**  
Sheet Iron, Copper, Pig Tin, Wire, Zinc, etc.

MANUFACTURERS OF  
**COPPER and BRASS.**  
Cliff St., bet. John and Fulton,  
**NEW YORK.**

**DICKERSON, VAN DUSEN & CO.,**  
Importers of  
Tin Plate, Pig Tin, Sheet Iron, Copper, Wire, Zinc, etc.  
29 & 31 Cliff St., cor. Fulton,  
DICKERSON & CO., Liverpool. **NEW YORK.**

**SCOVILL MFG CO**  
**BRASS,**  
Hinges, Wire, German Silver.

**PHOTOGRAPHIC GOODS.**  
**BUTTONS,**  
CLOTH AND METAL.

DEPOTS, 419 & 421 Broome St., N. Y.  
112 Federal St., Boston.  
183 Lake St., Chicago.

FACTORIES,  
Waterbury, Conn.  
New Haven, Conn.  
New York City.

**THE NEW HAVEN  
COPPER CO.,**  
255 Pearl Street, New York.  
Manufacturers of and Dealers in

**Braziers' & Sheathing  
COPPER.**

Kettle Bottoms, Bolts, Circles, Rivets,  
Ingot Copper, Spelter, Solder, &c.

**PASSAIC ZINC CO.**  
Manufacturers of  
**Pure Spelter**

FOR  
Cartridge Brass, Gas Fixtures, Bronzes  
AND ALL FINE WORK.

Also for  
Galvanizers & Brass Founders.  
**MANNING & SQUIER, Gen'l Agents**  
113 Liberty Street, N. Y.

**Brass Goods  
Mfg. Co.,**

280 Pearl St., N. Y., Manufacturers of  
**Stamped Brass & Silvered Goods**  
PLATED ROSERS, PICTURE NAILS,  
THIMBLES, DISKS,  
ESCUTCHEONS, BRASS CAPS,  
DROP BASES, LABLES.

**Patent Mirror Business Cards,**  
The only indestructible and most attractive card, specially made for exhibitions, fairs, &c.  
**Patent Tin Handle Machine Caps & Brushes.**  
Special facilities for manufacturing small articles of new style and design to order.

**R. SELLEW & CO.**  
Dealers in METALS,  
Tin Plate, Sheet Iron, Copper, &c.  
**SAINT LOUIS.**



## Metals.



**Waterbury Brass Co.**

CAPITAL, - - \$400,000.  
JOHN SHERMAN, Agent,  
296 Broadway, - - New York.  
Mills at WATERBURY, CONN.  
Sheet, Rolled and Platers' Brass,  
**GERMAN SILVER,**  
Copper, Brass and German Silver Wire,  
BRASS AND COPPER TUBING,  
**COPPER RIVETS & BURS,**  
**BRASS KETTLES,**  
WASH BASINS,  
Door Rail, Brass Tags & Step Plates,  
PERCUSSION CAPS,  
**POWDER FLASKS,**  
Metallic Eyelets,  
Shot Pouches,  
Tape Measures, etc.

"GREAT WESTERN" LANTERN.  
(All Brass), with Globes and Guards securely fastened.



Manufactured by the  
**MANHATTAN BRASS CO.,**  
83 Reade St., New York.

**Holmes, Booth & Haydens,**  
**WATERBURY, CONN.**  
NEW YORK, BOSTON,  
49 Chambers St. 18 Federal St.  
Manufacturers of all kinds of

Brass, Copper & German Silver,  
ROLLED AND IN SHEETS.

**BRASS & COPPER WIRE,**  
Tubing, Copper Rivets & Burs.

**BRASS & IRON**  
JACK CHAIN, DOOR RAIL.

German Silver Spoons,  
SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c.

**EDWARD MILLER & CO.,**  
Manufacturers of

**SHEET BRASS,**  
**Brass Kettles, Lanterns**

OILERS, KETTLE EARS,  
Spouts, Tinmen's Trimmings, Kerosene  
Lamps, Burners, Trimmings, &c.

35 Warren Street, New York.  
Mill and Factories, Meriden, Conn.

**JOHN DAVOL & SONS,**  
Agents for

Brooklyn Brass and Copper Co.,  
Dealers in

Ingot Copper, Spelter, Lead, Tin,  
Antimony, Solder & Old Metals.  
100 John Street, N. Y.

**Pittsburgh Lead Pipe and**  
**Sheet Lead Works.**

**BAILEY, FARRELL & CO.,**

167 Smithfield St., Pittsburgh, Pa.,  
MANUFACTURERS OF

Lead Pipe,  
Sheet Lead,

Bar Lead,  
Pig Lead,

Plumbers' Solder.

**BALTIMORE**  
**COPPER WORKS.**

**POPE, COLE & CO.,**  
Are now Purchasing

**Copper Ores**

and smelting and refining at these works, where, with  
experienced workmen and unusual facilities, are  
turning out Ingot and Cake Copper of unequalled  
purity and toughness.

We are prepared to buy Ores, Matte, Regulus and other  
furnace material in any quantities.

Office, 57 South Gay St.,  
Works at Canton, Baltimore, Md.

## Metals.

**The Plume & Atwood  
Mfg. Company,**  
MANUFACTURERS OF

**SHEET and ROLL BRASS and WIRE,**

German Silver and Gilding Metal,  
Copper Rivets and Burs,

**Kerosene Burners,**  
Shoe Eyelets, Lamp Trimmings, &c.

80 Chambers Street, New York.  
13 Federal Street, Boston.

Rolling Mill, Factories,  
THOMASTON, CT. WATERBURY, CT.

**Bridgeport Brass Co.,**  
MANUFACTURERS OF

Sheet and Roll Brass,  
Brass & Copper Wire & Tubing,  
German Silver Metal and Wire,  
Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,  
LANTERNS and TRIMMINGS, KEROSENE BURNERS,  
CLOCKS and CLOCK MOVEMENTS.

Particular attention paid to cutting out Blanks and  
manufacturing Metal Goods.

MANUFACTORY, WAREHOUSE,  
Bridgeport, Conn. 19 Murray St., N. Y.

**New Jersey Wire Mill.**  
**HENRY ROBERTS,**  
Manufacturer of

**Steel & Iron Wire.**  
SPECIALTIES:

Tinned Wire, Tinned Broom, Spring Wire, made  
from Bessemer Steel; Cast Steel and Iron Coppered  
Ball Wire; Rivet, Screw, Buckle, Umbrella, Fence,  
Brush, Gun Screw Wire; Sewing Machine and  
Machinery Wire. Fine Wire for weaving. Also Wire  
of any shape made to order.

**WIRE MILL, 39 Oliver St.,**  
**Newark, N. J.**

**Harrison Wire Company,**  
**ST. LOUIS, MO.**

THOS. W. FITCH, Pres. and Treas. CHAS. FISH, Secretary.

MANUFACTURERS OF  
All kinds of  
**IRON WIRE**

AND  
**Wire Mill Specialties.**

**GILBERT & BENNETT MFG. CO.,**  
GEORGETOWN, CONN.,  
MANUFACTURERS OF

**IRON WIRE, SIEVES AND**  
**WIRE CLOTH,**

Power Loom Painted Screen Wire Cloth,  
GILBERT'S RIVAL ASH SIEVE,  
Galvanized Twist Wire Netting,  
THE UNION METALLIC CLOTHES LINE WIRE,  
Warehouse, - 273 Pearl St., New York.

**THE TRENTON IRON CO.,**  
Trenton, N. J.

JAMES HALL, Treas. CHAS. HEWITT, Pres.

**IRON & WIRE.**  
Bar Iron. Wire Rods. Brazier Rods.

Market Wire, Weaving Wire,  
Screw Wire, Spring Wire,  
Fence Wire, Telegraph Wire,  
Bridge Wire, Chain Wire,  
Ball Wire, Buckle Wire,  
Square and Flat Wire, Tinned Wire,  
Cast Steel Wire, "Martin" Steel Wire

**GUN SCREW IRON WIRE,**  
FENCE STAPLES.

Wire straightened and cut to lengths. Represents  
in New York by  
**COOPER, HEWITT & CO.,**  
17 Burling Slip.

**Geo. W. Prentiss & Co.,**  
HOLYOKE, MASS.,  
MANUFACTURERS OF

**IRON WIRE.**

Bright, Coppered, Annealed and Tin  
Plated. Also GUN SCREW WIRE.  
Of all sizes straightened and cut to order.

**Washburn & Moen Manufacturing Co.**  
Established 1831.  
WORCESTER, MASS.

**Iron and Steel Wire,**  
PATENT STEEL BARB FENCING,  
Patent Steel Wire Bale Ties.

WIRE RODS of all Grades; Round Iron, Rivet quality, 3-16 in. to 1/2 in., cut to any length. Owners and ex-  
clusive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE, in  
coils of 100 pounds, without seam or weld. Patent Galvanized Telegraph Wire, Market and Stone Wire,  
Annealed Fence and Grape Wire in long lengths; Coppered Fall-Rail Wire; Rope, Bridge, Bolt, Screw, Rivet, Buckle  
and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds, &c. Piano-string Covering Wire,  
Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and  
Spiral Spring Wire, and Red-lead Wire to Pattern for particular purposes, from selected stamps of Norway Iron.  
Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,  
straightened and cut to any length. Steel Cripoline Wire, Patent Lignum Vitae. Unriveted Steel Music  
Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

WAREHOUSE, 42 CLIFF STREET, (NEW YORK). St. Louis Office, 717 North 2d Street.

**NATIONAL WIRE AND LANTERN WORKS,**  
Warehouse, 45 Fulton Street, New York.

**HOWARD & MORSE,**  
Manufacturers of

Brass, Copper and Iron WIRE CLOTH,  
Locomotive Spark Wire Cloth, Iron Wire Bolting Cloth,  
Ship and Railroad Lanterns, Signal Lights, Conductor's Lantern

ADJUSTABLE GLOBE HAND LANTERN,  
Desk and Office Railing, Riddles, Coal and Sand Screens, Nursery  
Fenders and Spark Guards, Ornamental Wire Fence.

**J. LLOYD HAIGH,**  
MANUFACTURER OF  
**Cast Steel, Bessemer Steel & Iron Wire**  
AND  
**WIRE ROPE**

OF EVERY DESCRIPTION.  
WIRE ROPE FOR Mines, Elevators, Inclined Planes, Derricks, Stays, Ship Rigging,  
Sash Cord, GALVANIZED WIRE CLOTHES LINES.  
SUSPENSION BRIDGE CABLES.  
WIRE—Bright, Coppered, Annealed, Tinned, Rivet, Spring, Machinery, Chain,  
Buckle, &c.  
Also Fence and Vineyard Wire.  
Galvanized Steel Barb FENCING WIRE, Plain and twisted, and Staples.  
Galvanized Telegraph Wire, Patent Tempered Cast Steel Furniture Springs.  
WORKS—South Brooklyn. OFFICES—81 John St., New York.

**IRON AND STEEL WIRE ROPE**  
For Hoisting, Running & Standing Ropes, Ferries, &c.  
CONSTANTLY KEPT ON HAND.  
Address, HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

**WORKS AT TRENTON, N. J.**

**ROEBLING'S WIRE ROPE**  
New York Office  
AND  
Warehouse  
AT  
117 Liberty Street.

**THE JOHN A. ROEBLING'S SONS CO.,**  
MANUFACTURERS OF  
**WIRE ROPE**  
OF  
Iron, Steel and Copper,  
FOR  
Hoisting Purposes of all  
kinds, for Ferries, Stays,  
Ship Rigging, Sash Cords,  
Lightning Rods, &c., &c.  
Suspension Bridge Cables.  
GALVANIZED WIRE CLOTHES LINES.

**W. S. ESTEY,**  
Manufacturer and Dealer in  
**Wire Cloths, Wire Goods and Wire**  
WORK of every description.  
Galvanized Twist Netting for Fencing Henneries,  
&c. Foundry Riddles and Steel Casting Brushes.  
59 Fulton Street, New York.

**THE WORCESTER WIRE CO.,**  
Cambridge St., Worcester, Mass.  
MANUFACTURERS OF  
**IRON AND STEEL WIRE**  
OF EVERY SIZE AND GRADE.  
Classification List mailed on application.



**EXCELSIOR WIRE WORKS.**  
JOSEPH HADDETON,  
Manufacturer of every description of  
Wire Goods, Flower Stands, Baskets and  
Counter Railings, Chairs, Settees,  
89 State Street, Rochester, N. Y.



**O. LINDEMANN & CO.**  
Manufacturers of  
Japanned, Brass and  
Silver Plated  
**Bird Cages.**  
Original Inventors  
of  
**Bright Metal  
Cages,**  
Constructed without  
solder.  
254 Pearl St.,  
NEW YORK.  
Our cages can be  
boxed for shipping.



**SHEPARD  
HAND  
FLUTER.**



**Extra Large Iron Roller.**  
NICKEL PLATED.  
**Shepard Hardware Co.,**  
(Successors to J. M. D. SHEPARD.)  
MANUFACTURERS.  
Send for Catalogue. BUFFALO, N. Y.

**Grant Fan Mill & Cradle Co.**  
Manufacturers of  
Grant's Grain, Coffee, Rice, Cochineal  
and Pimento Fans,


**TURKEY WING GRAIN CRADLES,**  
4, 5 and 6 fingers.  
**GRAPE VINE GRAIN CRADLES,**  
4 fingers.  
**SOUTHERN PATTERN GRAIN  
CRADLES,**  
4, 5 and 6 fingers.  
All of a superior quality. None  
genuine unless marked Grant  
Fan Mill & Cradle Co. Send for  
illustrated catalogue & price list.  
P. O. Address, Melrose,  
Hesselsner Co., N. Y.




**The Patent Combined  
Dinner-Pail  
AND  
Lantern.**  
The most perfect Dinner Pail  
in the world. Hot coffee for  
dinner and a Lantern at night.  
Manufactured by J. S. HAIGHT,  
PORT CHESTER, N. Y.  
Agents Wanted.



**ESTABLISHED 1835**  
**BENIS & CO.**  
HARDWARE & TOOL CO.  
ALL GOODS STAMPED BENIS & CO.  
NONE OTHERS GENUINE




**A. F. PIKE,**  
East Haverhill, New Hampshire,  
Manufacturer and Wholesale Dealer in  
**Scythe, Axe, Knife and Hacker  
STONES.**  
**LETOILE,  
UNION,  
PREMIUM,  
DIAMOND GRIT,  
WHITE MOUNTAIN,  
INDIAN POND** (red ends)  
Stones gotten up or labeled in  
any style desired. Price and  
quality guaranteed.  
Our Stones are of wood keels  
and will not glaze.



**S. L. SAMUEL,**  
Hardware Manufacturers' Agent  
**For EXPORT.**  
Advances made on consignments.  
57 Cedar Street, NEW YORK.

**CARY & MOEN,**  
Manufacturers of  
**STEEL WIRE for all purposes, and STEEL SPRINGS of every description.**



Market Steel Wire, Crinoline Wire, tempered and covered.  
Also Patent Tempered Steel Furniture Springs, constantly on hand.  
934, 936 and 938 West 29th Street, NEW YORK.

**THE PERFECTION STOVE PIPE.**  
Patented.  
**Reduction in Price.**

Our large production of this article enables us to reduce prices, as will be noted below. This Pipe is rapidly gaining in favor and must eventually supersede the old style entirely. Made wholly by machinery, every joint is exactly alike, and all fit together with perfect accuracy. A child can adjust it, no tools being required. It is indispensable in the household on this account. Fifty joints of 5 inch Pipe can be packed in a case 10 inches square by 24 inches long inside, thus occupying hardly more room than Tin Plate, and securing the lowest rates of freight. The following are net cash prices, no charge for cases: 5 in., per joint, 11c.; 6 in., per joint, 12c. Other sizes in proportion. Sole manufacturers for the United States

**THE CHICAGO STAMPING CO.**  
We shall remove May 1st to Nos. 10, 12 & 14 Lake St., Chicago.

**ESTABLISHED IN 1848.**  
**SINGER, NIMICK & CO.,**  
PITTSBURGH, PA.  
MANUFACTURERS OF ALL KINDS OF  
**HAMMERED AND ROLLED  
STEEL,**  
Warranted Equal to any Produced.

**BEST REFINED TOOL CAST STEEL**  
For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,  
Cold-Chisels and Machinists' Tools generally.  
**SAW PLATES**  
For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.  
**Sheet Steel**  
For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,  
Stamping Cold, &c., &c.

**SIEMENS-MARTIN (Open-Hearth) PLATE STEEL**  
For Rollers, Fire-Boxes, Smoke Stacks, Tanks, &c.  
All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface finish and exactness of gauge.  
**ROUND MACHINERY CAST STEEL**  
For Shafting, Spindles, Rollers, &c., &c.  
File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.;  
Cast and German Spring and Pile Steel.  
Finished Rolling Pile Counters with Patent Screw  
Hubs attached.  
"Soft Steel Center" Cast Pile Steel.  
"Solid Soft Center" Cast Pile Steel.  
Agricultural Steel cut to any pattern desired.  
Steel Forgings made to order.  
Represented at 59 BEEKMAN ST., NEW YORK, by  
**HOGAN & BURROWS, Gen'l Agents for Eastern and New England States.**

**STONE IRON WARE.**  
Patented in America and Europe and  
Popular Everywhere.  
FERNALD & SISE, 100 Chambers St., New York Agts.



**THE METAL STAMPING & ENAMELING CO.,** 708, 710 & 712 Second St., ST. LOUIS, MO.

**The Windsor  
OIL STOVE.**



The first application of scientific principles applied to produce absolute safety from explosion or accident. The hydrostatic column, supplied from the water pan, and supplying water to the bottom of the oil reservoir as the oil is consumed, not only keeps the reservoir solid full, so as to afford no space for the accumulation of explosive vapors, but also raises the oil in the wick tubes so near the flame that a uniform heat is insured.  
The most that can be said of any other Kerosene Stove is that it may not explode. The least that can be said of the Windsor Stove is that it cannot explode.  
It affords a good margin to the dealer, and its merits make it the easiest stove to sell and the most satisfactory to the buyer.

**W. A. HULL & BRO.,**  
35 Park Place, New York.

## The Currency of China.

(Concluded.)

Chinese assaying establishments are called Kungkoo. They are not found in all the cities of the empire, nor even in many of the most important. Mr. Billequin, Professor of Chemistry in the Imperial College of this city, is of the opinion that very little silver is refined here. In a report of the United States Consul at Newchwang, made in 1870, he states that "There is no kungkoo here, anyone who chooses may fabricate ingots of silver, and the only check upon such persons is their fear to lose their reputation for honesty."

The Commissioner of Customs at Chefoo reported in the same year that "serious inconvenience, delay and losses have resulted to foreign merchants from the quantity of inferior sycee in circulation. To remedy this a kungkoo has been established, but the country buyers refuse to recognize it, and suspension of business with the interior has resulted." In 1865 the commissioner at Hankow wrote: "In the early days of this port the demand for sycee was so sudden and extensive that Shanghai was unable to supply standard sycee in sufficient quantities. It thus arose that sycee of an inferior quality was transmitted to this port, and on its being found that adulterated silver was accepted as equivalent to standard, the practice originally exceptional became the rule, and sycee, depreciated to the extent of two, three or even four mace per shoe, was regularly manufactured for the Hankow market. About two years ago an attempt was made to establish a kungkoo, or assay office, which was unsuccessful, and the failure was followed by an enormous increase in the depreciation of silver. It was not, however, until the present month that an assay office, duly recognized by the Chinese and the consular authorities, was opened."

In the absence of assay offices the Chinese rely upon the touch. Le Compté, writing in 1790, says what is equally true at this day: "They are so expert in guessing at the goodness of any piece of silver by looking on it only that they are seldom mistaken, especially if it be melted after the manner practiced by them. They know the goodness in three ways—by the color, by small holes which were made in melting, and by the small circles which the air makes on the surface of the metal when it cools. If the color be white, the holes small and deep—if the circles be many, and those close and very fine, especially toward the center of the piece, then the silver is pure, but the more it differs from these three indications so much the more alloy it has."

While it appears that uncertainties arising from the multiplicity of standards, the imperfect construction of scales and the defective means of testing the quantity of silver must prove a great source of annoyance to those who have occasion to use the metal, in one way and another fairly accurate results seem to be reached. This is the case, at least, as between the open ports. There is, of course, frequent occasion to remit bullion from the northern and riverine ports to Shanghai. I am informed that such remittances almost invariably result according to the expectations of shippers.

It follows from what has been said, that however defective may be the test of silver and of the scales by which it is weighed, no such failures attend its use for purposes of a currency as have been experienced in the case of the copper currency already described.

That silver is the real standard of value is well understood by the Chinese. We have seen that a cash is supposed to be the one-thousandth part of a tael of silver. This is the declaration of the government and indicates the view taken by it. But cash pass among the people for just so much as they consider them worth, having regard to their intrinsic value and their convenience as a medium of exchange. The government, recognizing its failure to keep the coin up to standard, has accepted the action of the people and receive cash in payment of taxes only at the exchange current among them. The dues collected at the foreign customs are in silver, and remittances from the provinces to the capital are in silver or in bankers' bills calling for silver. The penal code provides that soldiers and citizens shall not use in their houses any utensils of copper save as are permitted by the law, and that any excess shall be given over to the government at a stated price in silver. Importations of copper from Yunnan are similarly not to cost more than a stated price in silver.

What has been said will indicate the position of cash and silver in the Chinese currency. It remains to speak of gold.

It cannot be doubted that the latter forms a part of the currency, but this is true only to a limited extent. It is more properly a merchandise which is bought and sold in the market.

The tendency throughout Asia is to place a lower relative value upon gold than prevails in Europe and America. In China this tendency has been a normal one and not the result of legislation, for in one sense gold and silver are equally articles of commerce—that is to say, neither has been coined. The case has been different in Japan, gold and silver having been long coined there. At the date of Commodore Perry's treaty gold, judged by the face value of coins in circulation, was worth only five times as much as silver. It is understood that the government received the whole production of the mines, and as no considerable import or export of the precious metals was allowed, it was able to establish their relative value by decree.

Quotations of these metals in China and Japan must be received with the reservation that one cannot be sure how far pure gold has been weighed against pure silver. I think that, as a rule, the gold is purer than the silver.

Rondot gives the following table:

Years.	City.	Gold.	Silver.
1825	Canton	1	10
1835	Canton	1	4
1870	Peking	1	17 1/2
1880	Canton	1	10
1890	Peking	1	21
1894	Canton	1	17
1895	Canton	1	16

These quotations are so widely and irregu-

larly at variance that their accuracy may be greatly questioned. It is the general fact, however, which is in point, and regarding this the two following quotations are sufficient:

Lecompte, writing in 1690, says: "Europeans make a good market of gold, because in China a pound of it bears but the same proportion to a pound of silver as one to ten, whereas among us it is one to fifteen." Sir George Staunton, writing a century later, made the following statement: "In general, the value of silver has borne a much greater proportion to that of gold in China than in Europe, excepting when an extraordinary demand for the latter by foreign merchants has increased the rate of it."

I have been at some pains to collect statistics of the relative values of the metals for recent years. The general result shows that while the markets have been sensitive to the European demand, there have been some wide fluctuations. The lowest quotation in the last 30 years is 1 to 12.8, (at Shanghai in 1855), the highest is 1 to 17.5 (at Peking in August, 1876).

There is here an exchange for the purchase and sale of gold at which the price is determined for the day. Whether similar exchanges may be found in other cities I do not know. I imagine, however, that there is relatively more gold in circulation at Peking than at other leading points, for the reason that a great deal of trade with Mongolia, Central Asia and Siberia centers here, bringing in that metal, and that persons of the official class coming here for greater or less periods find it more convenient to carry than silver. There is a constant flow of gold in commerce from the northern ports to Shanghai and the south, but the quantity of it so moved is not great.

Paper obligations of one kind and another take an important place in the currency of the empire. None of this, so far as I know, is issued or sanctioned by the government, and all issues which are intended for currency purposes are to be classed as "shin plaster" paper, as the American term is. Probably, however, 75 per cent. of the smaller business of Peking is transacted with such paper. In some cities, as at Shanghai for instance, it is never seen. Foochow has long enjoyed prominence in the use of paper money, and it is likely that the practice followed here and in that city will be found to exist in many others. One author says: "Bank notes, payable to bearer, are in use throughout the empire, and are issued by the great houses of business, and accepted in all the principal towns." At Shanghai, by far the greater part of the merchandise purchased by Chinese from foreigners is paid for by orders drawn by the native bankers on themselves, and having usually ten days to run. Formal bills of exchange drawn by bankers in one city upon those in others are greatly used. At times a considerable part of the revenue transmitted to Peking from other parts of the empire has been sent up in this way.

It may be assumed, I think, that paper in its different forms takes the place of silver and cash in the transaction of business generally to a very considerable extent, and that this result is largely due to the facts that cash are inconvenient to handle, and that the use of silver is attended with difficulties not met with where a coinage system exists.

The failure of the Chinese to coin precious metals is due to a variety of reasons. Du Halde says quaintly: "It is easy to judge that there would be many debasers of money in China if silver was coined, since the small pieces of copper are so often counterfeited." Dr. Williams says: "Silver and gold coin were both used in China at different periods of her ancient history, but never have been issued by the present or any modern dynasty. A consciousness of their inability to maintain the standard alloy and weight throughout their vast domain, and a knowledge of the facility with which the coins could be counterfeited, combined with their ignorance of the advantages of a gold and silver currency and a disposition to meddle with the coinage, explains why the Manchus have never attempted to circulate silver coins." Issues of silver, moreover, could be made only at or near the intrinsic value of the metal used. Upon such issues the government could make but small profit, while as we have seen the profit upon issues of cash is very great.

It cannot be supposed, however, that the Chinese are different from other people in their need for and their capacity to appreciate a currency convenient in form and based on value. The Mexican dollar is much used at Shanghai, and it is always at a premium. Two years ago it ran up in a few months from 72.5 to 82.4 per cent. of the local tael, a range of 10 per cent. nearly, in the relative value of silver conveniently coined and silver as bullion. Twenty years ago the Carolus dollar came to be at par with the tael. At Canton, dollars although passed by weight, are generally, as we have seen, at a small premium over bullion. In this city they pass freely, but at a slight discount. At Tientsin, as I am informed, they have sometimes been in such demand that it would pay to import them from Shanghai. Experience shows, as I believe, that if the supply of foreign dollars were constant and sufficient they would come to be the money of account at all the open ports.

In making this statement I am aware it involves the proposition that the government would have no serious difficulty in establishing a mint and in putting out coins of determined value. They would need only to offer such money to their people to have it accepted. It would not be necessary to declare it legal tender, but on the contrary, better that this should not be done, saving in respect of customs dues. At first, doubtless, it would be regarded with suspicion, as anything is in China which is strange. The readiness of the government to receive it would commend it greatly to the people, and their freedom to receive or to reject it would dispel doubt. The absence of legal tender laws would prevent any movement to debase the coin, for so soon as debased the people would discover and reject it. Well executed coins would be so difficult to counterfeit as to prevent danger of this kind. In point of fact, all the reasons would exist for the acceptance of such coins which have induced the acceptance so widely of



**Iron.**

NEW YORK.

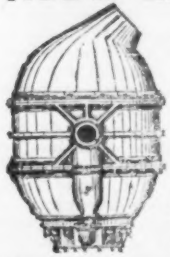
**OGDEN & WALLACE,**  
Successors to G. M. L. G. SMITH & CO.,  
**IRON & STEEL,**  
85, 87, 89 & 91 ELM ST., N. Y.  
**COMMON AND REFINED  
BAR IRON.**  
SHEET AND PLATE IRON,  
HOOP, BAND AND SCROLL IRON,  
Rod and Horse Shoe Iron,  
Angle and T Iron,  
Swedes and Norway Iron, Norway Nail Rods.  
Iron of all sizes and shapes made to order.

**PIERSON & CO.,**

24 & 26 Broadway, 77 & 79 New St.,  
NEW YORK CITY.  
"PICKS" of all kinds,  
ESOPUS" HORSE SHOE IRON  
BEAMS, ANGLES,  
Tees, Channels, Sheets, Plates.  
All descriptions in stock.

**IRON & STEEL.**

**J. H. JACKSON & CO.,**  
206 & 208 Franklin St., N. Y.  
Importers and Dealers in

**IRON and STEEL.**

Agents for  
**JOHN A. GRISWOLD & CO'S**  
Bessemer Steel.  
MACHINERY STEEL,  
Cast Steel and  
SPRING STEEL,  
ANGLE and T IRON.  
Special Irons for Bridge and  
Architectural Work.

**ABEEL BROTHERS,**

Established 1765 by ABEEL &amp; BYVANCK.

**Iron Merchants,**  
190 South Street and 365 Water, N. Y.  
**ULSTER IRON**

A full assortment of all sizes constantly on hand.  
Refined Iron,  
Horse-Shoe Iron,  
Common Iron.  
Band, Hoop and Scroll Iron.  
Sheet Iron.  
Norway Nail Rods.  
Norway Shaes.  
Cast, Spring and Tire Steel, etc.

**A. R. Whitney,**

Manufacturer of and Dealer in

**IRON,**

56, 58 & 60 Hudson,  
48, 50 & 52 Thomas, and  
12, 14 & 16 Worth Sts., } **NEW YORK.**

Our specialty is in  
Manufacturing Iron Used in the Con-  
struction of Fire-Proof Buildings,  
Bridges, &c.

Plans and estimates furnished, and contracts made  
for erecting Iron Structures of every description.  
Books containing cuts of all Iron made sent on ap-  
plication by mail. Please address  
Sample pieces at office. 58 Hudson Street.

**BORDEN & LOVELL,**  
**Commission Merchants**

70 &amp; 71 West St.,

New York.

Agents for the sale of

Fall River Iron Co.'s Nails,  
Bands Hoops & Rods  
AND  
Borden Mining Company's  
Cumberland Coals.

**WILLIAM H. WALLACE & CO.,**  
**IRON MERCHANTS**

Cor. Albany &amp; Washington Sts.,

NEW YORK CITY.

WM. H. WALLACE. WM. BISHAM.

**DANIEL F. COONEY,**  
Late of and Successor to J. H. H. Holdans & Co.,  
88 Washington St., N. Y.

**BOILER PLATES and SHEET IRON,**  
LAP WELDED BOILER FLUES.  
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.  
Agency for Pottsville Iron Co., Vindicator Iron Works,  
Lebanon Rolling Mills, Pine Iron Works, Laurel Iron  
Works, The Bergen Rolling Mills, at Jersey City.

**OXFORD IRON CO.,**  
**Cut Nails and Spikes,**

R. R. Spikes, Splice Bars and  
Nuts and Bolts,  
81, 83 & 85 Washington, near Reister St., N. Y.

JAMES S. SCRANTON, Agent.

**Iron.**

NEW YORK.

**G. HUERSTEL,**  
**IRON and STEEL,**  
Warehouse, 99 Market Slip, N. Y.  
Sole Agent for Sweden's Iron Castings.  
Constantly on hand, Refined and Common Iron, Horse  
Shoe Iron and Nails, Norway Iron, Cast, Spring,  
Toe Calk and Bessemer Steel Tire.  
Also SPRINGS, AXLES AND BOLTS.  
For Truck and Carriage Makers.

**A. B. Warner & Son,**  
**IRON MERCHANTS,**  
28 & 29 West and 52 Washington Sts.  
**BOILER PLATE,**

Boiler Tubes, Angle, Tee & Girder Iron,  
Boiler and Tank Rivets.  
Sole Agents for the celebrated

"Eureka," Pennocks,  
"Wawasset," Lukens,

Brands of Iron. Also all descriptions of Plate, Sheet,  
and Gasometer Iron. Special attention to Locomotive  
Iron. Fire Box Iron a specialty.

**POWERTVILLE**  
**ROLLING MILL.**

**JOHN LEONARD,**  
450 & 451 West Street, NEW YORK.  
Manufacturer of Best Quality  
**HORSE SHOE IRON,**  
And HOOPS. Also Best Quality  
Cold Blast Charcoal Scrap Blooms,  
And Dealer in OLD IRON.

**Geo. A. Boynton**  
**BROKER IN IRON**  
70 WALL ST., N. Y.

**MARSHALL LEFFERTS,**  
90 Beekman St., New York City,  
MANUFACTURER AND DEALER.

**Galvanized Sheet Iron,**  
1st and 2d Qualities.

Galvanized Wire, Telegraph and Fence; Galvanized  
Hoop and Band Iron, Galvanized Rod and Bar Iron,  
Galvanized Nails, Galvanized Chain, Galvanized Iron  
Pipe.

**CORRUGATED SHEET IRON**  
For Roofing, &c., Galvanized, Plain or Painted.  
Best Charcoal, Best Refined and Common  
**SHEET IRON.**

**Plate and Tank Iron,**  
C No. 1, C H No. 1, C H No. 1 Flange, Best Flange  
Best Flange Fire Box, Circles.

**BOILER IRON**  
Stamped and Guaranteed.

All descriptions of Iron Work Galvanized or  
Tinned to order.  
Price list and quotations sent upon application.

**Dan'l W. Richards & Co.,**

Importers of and Dealers in

**SCRAP IRON,****Pig Iron,****OLD METALS.**

88 to 104 Mangin Street,

Foot of Stanton St., E. R., NEW YORK.

**JAMES WILLIAMSON & CO.,**

SCOTCH AND AMERICAN

**PIC IRON,**

No. 69 Wall St., New York.

**W. J. Carmichael,**

DEALER IN

**Iron & Steel Boiler Plate,**

Lap Welded Boiler Tubes, &amp;c., &amp;c.

130 &amp; 132 Cedar Street, New York.

**POTTSVILLE SPIKE, BOLT AND NUT WORKS.**

RAILROAD SPIKES, MINING SPIKES,

MACHINE BOLTS, MACHINE FORGED NUTS,

TRACK BOLTS &amp;c.

CEO. D. ROSEBERRY, Manufacturer, Pottsville, Pa.

**LEECHBURG IRON WORKS.**

KIRKPATRICK, BEALE &amp; CO.

Manufacturers of all grades of

**FINE SHEET IRONS,**

(Refined, Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel.

TIN AND TERNE PLATES, made with Natural Gas as fuel.

OFFICE, No. 116 Water St. Pittsburgh, Pa.

**Iron.**

NEW YORK.

**John W. Quincy,**  
98 William Street, New York.  
**Anthracite & Charcoal Pig Irons,**  
Wrought Scrap, Cut Nails, Copper,  
BLOCK TIN, LEAD, SPELTER, ANTIMONY, NICKEL, &c

**Fuller Mills and Anchor**  
**CUT NAILS,**

HOT PRESSED NUTS,  
BOLTS, WASHERS, &c.

**Fuller Brothers & Co.,**  
139 Greenwich Street, New York.

**HARRISON & GILLOON**

**IRON AND METAL DEALERS,**  
558, 560, 562 WATER ST., and 802, 804, 806 CHERRY ST.,  
NEW YORK.

have on hand, and offer for sale, the following:  
Scotch and American Pig Iron, Wrought, Cast and  
Machinery Scrap Iron, Car-Wheels, Axles and Heavy  
Wrought Iron; also old Copper, Composition, Brass,  
Lead, Pewter, Zinc, &c.

**BURDEN'S**  
**HORSE SHOES.**

"Burden Best"  
Iron  
Boiler Rivets.

Burden Iron Works, H. Burden & Sons,  
Troy, N. Y.

**B. F. JUDSON,**

Importer of and Dealer in  
**SCOTCH AND AMERICAN**  
**Pig Iron,**

Wrought & Cast Scrap Iron,  
**OLD METALS.**

457 &amp; 459 Water St., } NEW YORK.

233 &amp; 235 South St., }

**Passaic Rolling Mill Co.,**

PATERSON, N. J.

**Iron Bridge Builders**

And Manufacturers of

Beams, Channels, Angles,

**TEES,****Merchant Iron, &c., &c.**

New York Office, 138 Chambers Street.

WATTS COOKE, President.

W. O. PAYERWEATHER, Treasurer.

CHAS. O. BROWN, Engineer.

**P. W. GALLAUDET,**

Banker and Note Broker,  
Nos. 3 and 5 Wall Street,  
NEW YORK.

HARDWARE, METAL, IRON, RUBBER, SHOE,

PAPER AND PAPER-HANGINGS, LUMBER, COAL

AND RAILROAD PAPER WANTED.

ADVANCES MADE ON BUSINESS PAPER AND

OTHER SECURITIES.

**Moseley Iron Bridge & Roof Co.,**

**CORRUGATED IRON**  
Buildings, Roofs, Shutters,  
Doors, Iron Sashes,  
Skylights, &c.

5 Dey Street, New York.

**Iron.**

PITTSBURGH.

**W. D. WOOD & CO'S**

**PATENT**  
**Planished Sheet Iron.**

Patented March 14th, 1865; April 8th, 1873;  
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the

**IMPORTED RUSSIA IRON,**  
and at a much less price.

**FOR SALE,**  
by all the principal

**METAL DEALERS**

In the Large cities throughout

**THE UNITED STATES.**

And at their Office,

111 Water Street, PITTSBURGH, PA.

JOHN COYNE. A. G. HATRY.

**COYNE & HATRY,**

Patentees and Manufacturers of

**Automatic Nail Selectors,****IMPROVED CUT NAIL MACHINES,****And Nail Factory Supplies.**

WORKS, cor. 20th &amp; Mulberry Sts.,

OFFICE, No. 114 &amp; 115 Water St., Pittsburgh, Pa.

**JUNIATA**

**HORSE SHOES.**  
**Nails and Spikes,**  
**STEEL TOE CALKS.**

Horse Shoe Bar  
**AND SHEET IRON.**

SHOENBERGER &amp; CO. Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

**BALDWIN LOCOMOTIVE WORKS,**

BURNHAM, PARRY, WILLIAMS & CO., Proprietors,  
Philadelphia, Pa., U. S. A.,  
Manufacturers of

**LOCOMOTIVE ENGINES**

of every Description.  
Catalogues, photographs and estimates fur-  
nished on application of customers.

**NOISELESS STEAM MOTORS,**

For city and suburban Railways.

These machines are nearly noiseless in opera-  
tion; show no smoke with the use of anthracite  
coal or coke as fuel, and show no steam whatever  
under ordinary conditions of service. They can  
be run at two or three times the speed of horse  
cars and draw additional cars. Circulars with full particulars supplied.**ZUC & CO.,**

Pittsburgh, Pa.,

Manufacturers of

**Wheeler's Iron & Steel Combination Shafting,**

Under license of the Combination Trust Co., Philadelphia.

This Shafting is superior to any now on the market, and the attention of machinists is

particularly called to it and a trial order solicited. Prices furnished on application.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.

Pittsburgh, Pa.



**Iron.**  
PHILADELPHIA.  
**Siemens' Regenerative  
GAS FURNACE.**  
**RICHMOND & POTTS,**  
119 S. Fourth St. PHILADELPHIA, PA.

**A. PURVES & SON,**  
Corner South & Penn Streets, Phila.,  
Dealers in  
Scrap Iron & Metals, Machinery, Tools,  
Shafting & Pulleys, Steam Engines,  
Pumps & Boilers, Copper, Brass,  
Tin, Rabbit Metals, Foundry  
Facings. Best Quality Ingot Brass.  
Cash paid for all kinds of Metals and Tools.

**CHESTER IRON COMPANY,**  
MINERS AND SHIPPERS OF  
**Magnetic Iron Ore.**

The "BLUE" (Red Short) and "RED" (Neutral) Bessemer Ores, from Hacklebarney and Chester, New Jersey.  
Price "Blue" Ore hand-broken and selected for July is \$2.50 cash, f. o. b. Hacklebarney Mines.  
J. WESLEY PULLMAN, Treas., 407 Walnut St., Philadelphia.

**The Cambria Iron and Steel Works,**  
Having enjoyed for over TWENTY YEARS the reputation of producing the best quality of  
**RAILS,**  
have now an annual capacity of  
**100,000 Tons of Iron and Steel Rails, Splice Bars, &c.**  
ADDRESS,  
**CAMBRIA IRON COMPANY,**  
No. 218 South 4th Street, Philadelphia.  
Or at the Works, JOHNSTOWN, PA.  
Or J. S. KENNEDY & CO., New York Selling Agency, 41 Cedar St., N. Y.

**THE PHOENIX IRON CO.,**  
410 Walnut Street, PHILADELPHIA.  
Manufacturers of  
**CURVED, STRAIGHT AND HIPPED  
Wrought Iron Roof Trusses, Beams, Girders & Joists,**  
and all kinds of Iron Framing used in the construction of Iron Roof Buildings.  
**DECK BEAMS, CHANNEL, ANGLE AND T BARS**  
curved to template, largely used in the construction of Iron Vessels.  
**PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,**  
For Top and Bottom Chords of Bridges.  
**Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.**  
**REFINED BAR, SHAPING, and every variety of SHAPE IRON made to order.**  
Plans and Specifications furnished. Address,  
**SAMUEL J. REEVES, President.**

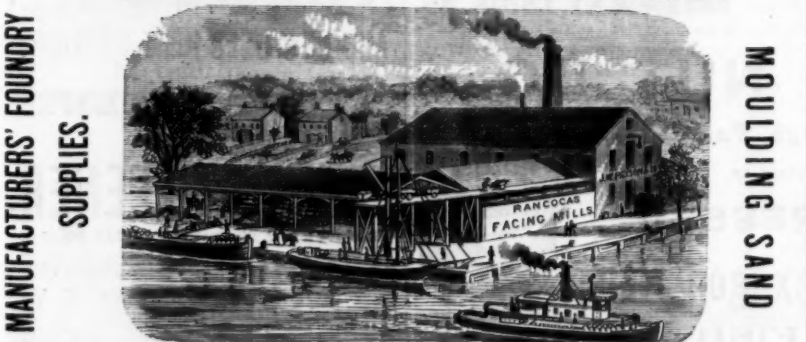
**The Standard Steel Works.**  
**LOCOMOTIVE AND CAR WHEEL TIRES,**  
Manufactured from the celebrated OTIS STEEL.  
BRAND  
**STANDARD.**  
Quality and efficiency fully guaranteed. Prices as low as any of the same quality.  
We manufacture  
Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, Etc.  
Works at Lewistown, Pa. Office, 220 S. 4th St., Philadelphia, Pa.

**NAILS**  
**JAS. ROWLAND & CO.,**  
Kensington Iron, Steel & Nail Works,  
920 North Delaware Ave., - - PHILADELPHIA,  
Manufacturers of the  
Anvil Brand Refined Merchant Bar Iron.  
Also, the James Rowland & Co. Kensington Nails, cut from their  
Refined Anvil stock. Also, Plow and Cultivator Steel, Rounds,  
Squares, Flats, Bands and Hoop Iron.  
Correspondence with Dealers solicited.

**PENCOYD IRON WORKS.**  
**A. & P. ROBERTS & CO.,**  
Manufacturers of  
**CAR AXLES.**  
**BAR, ANGLE, TEE AND CHANNEL IRON.**  
Office, No. 245 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

**STANDARD**

**FOUNDRY FACINGS.**



**GERMAN LEAD, BITUMEN, SIEVES, MACHINERY SAND,  
AMERICAN LEAD, ANTHRACITE, SHOVELS, BRASS  
GRAPHITE, CHARCOAL, BRUSHES, CHANDELIER  
PLUMBAGO, MINERAL, CRUCIBLES, STOVE PLATE**  
**J. W. PAXSON & CO.** OFFICE & STOREROOMS,  
2514, 2516 and 2518 Beach St., Philadelphia, Pa.

**Iron.**  
PHILADELPHIA.  
**H. L. GREGG & CO.,**  
Ship Brokers & Commission Merchants,  
Importers of  
**Old Iron, Metals and Rags.**  
Freight engagements made to all parts of the world.  
Marine insurance effected in reliable offices.  
108 Walnut St., Phila.

HENRY LEVY. F. J. KIMBALL.  
**LEVIS & KIMBALL,**  
**Manufacturers' Agents**  
For Iron and Steel Rails, Car Wheels, Boiler and  
Sheet Iron and General Railway  
Equipments.  
Old Rails, Axles, and Wheels bought and sold.  
261 S. 4th St., Philadelphia.

**Iron.**  
H. E. COLLINS. JAS. H. MURDOCK.  
**H. E. COLLINS & CO.,**  
BROKERS IN  
**Manufactured  
IRON, NAILS  
STEEL,  
Pig Iron, Iron and Steel Rails,  
METALS,**  
Railway Supplies, Old Rails and Railway Scrap,  
PITTSBURGH, PA.

**Edward J. Etting,**  
IRON BROKER AND COMMISSION MERCHANT,  
230 S. Third St., Philadelphia, Pa.  
CENTRAL IRON WORKS, - Harrisburgh, Pa.  
**Boiler Plate, Tank Iron, &c.,  
Pig, Bar and Railroad Iron,  
Old Rails, Scrap, &c.**  
STORAGE WHARF & YARD,  
DELAWARE AVENUE ABOVE CALLOWHILL STREET,  
connected by track with railroad  
Cash advances made on Iron.

**The Iron-Masters'  
LABORATORY.**  
Exclusively for the  
Analysis of Ores of Iron, Pig and Manufac-  
tured Iron, Steels, Limestone, Clays,  
Slags and Coal for Practical  
Metallurgical Purposes.  
No. 339 Walnut St., Philadelphia.  
J. BLODGET BRITTON.

This laboratory was established in 1866, at the in-  
stance of a number of practical Iron Masters, ex-  
pressly to afford prompt and reliable information  
upon the chemical composition of the substances  
above mentioned, for smelting and refining pur-  
poses. The object being to make it at once a con-  
venient, practically useful, and comparatively in-  
expensive adjunct to the Furnace, Forge and Rolling  
Mill.

**CHARGES TO IRON WORKS.**  
For determining the per cent. of Pure Iron in  
an ordinary Ore..... \$4.00  
For the per cent. of Pure Iron, Sulphur and  
Phosphorus in do..... 12.50  
For each additional constituent of usual oc-  
currence..... 1.50  
For those of unusual occurrence or difficult  
to determine, the charge must necessarily  
depend upon circumstances.  
For determining the per cent. of Sulphur or  
Phosphorus in Iron or Steel..... 7.00  
For each additional constituent of usual oc-  
currence..... 5.00  
For the per cent. of Carbonate of Lime, and  
insoluble Silicious Matter in a Limestone..... 10.00  
or each additional constituent..... 2.00  
For the per cent. of Water, Volatile Combus-  
tible Matter, fixed Carbon, and Ash in Coal..... 12.50  
For determining the constituents of a Clay, Slag,  
Coke, or of an Ash in Coal the charges will corre-  
spond with those for the constituents of an ore.  
For a written opinion or letter of instruction the  
charge must necessarily depend upon circum-  
stances.  
Printed instructions for obtaining proper average  
samples for analysis furnished upon application.

**BOSTON ROLLING MILLS**  
Manufacture  
BEST QUALITY SMALL RAILS, from best selected Scrap Iron  
**SWEDISH AND NORWAY SHAPES,**  
Nail and Wire Rods. Also,  
**Horse Shoe Iron, Hand Made  
Horse Shoes & the Boston  
Horse Shoe.**  
BOSTON ROLLING MILLS, W. R. ELLIS, Treas.  
Office, 17 Battery March St., Boston.

**BRADLEY, REIS & CO.,**  
NEW CASTLE, PA.,  
Manufacturers of every description of  
**PLATE & SHEET IRON**  
OFFICE, at Works.

**Bonnell, Botsford & Co.,**  
**Iron, Nails & Spikes.**

**YOUNGSTOWN, OHIO.**  
**Spooner & Collins,**  
COMMISSION AGENTS,  
**PIG IRON**  
Blooms, Bar, Sheet & Hoop Iron.  
217 N. Third St., St. Louis.

**PATENT MINERAL WOOL,**  
The Best and Cheapest Non-Con-  
ductor or Insulator of Heat  
or Cold.

Used for covering steam pipes, boilers; for lining  
water pipes, hydrant and street washer boxes,  
refrigerators, cold storage houses, &c. Cheap  
enough for deafening walls of dwellings, factories,  
&c. State rights for sale. Send for circular to  
**ALEXANDER D. ELBERS,**  
No. 26 1/2 Broadway, N. Y., P. O. Box 4461

**BORAX.**  
Concentrated Borax in sacks.  
Selected concentrated Borax in barrels.  
Refined Borax in cases.  
Pulverized Borax in barrels.  
Pulverized Borax in pound and half pound packages.  
Being Sole Agents for Messrs. Smith Bros., OWNERS OF  
THE MINES, we are enabled to sell at the lowest prices.  
**WM. T. COLEMAN & CO.,**  
NEW YORK, 120 Pearl Street.  
SAN FRANCISCO, CAL., cor California and Front Sts.

certain foreign coins, and many more besides.  
That great opposition to the establishment  
of a mint must be expected is manifest.  
Foreign bankers appear to prefer to have  
the currency in its present irregular and un-  
certain condition, doubtless because they  
make a profit from it. How much more  
native bankers and money changers and  
receivers of the revenue and disbursing offi-  
cers will strive to uphold the existing system  
may be readily imagined.

It is well known, however, that the Chi-  
nese central authorities and some of their  
leading provincial officers are alive to the  
evils of the present system, and disposed to  
introduce remedies, and it may be predicted  
with safety that a coinage system will be  
adopted within a near period. I do not say  
within five or ten years, or attempt to anti-  
cipate the date. It is coming to be a felt  
want and such wants create their remedy.  
It is evident that no step short of the  
establishment of a mint can effect a radical  
improvement of the currency. Gold and  
silver must be coined in order to be con-  
venient for use, and such coins must be  
authoritatively issued in order to be ac-  
cepted without hesitation or doubt. The  
object to be kept in view then is the estab-  
lishment of a mint and nothing less.

It may be possible, however, to correct  
some of the evils of the existing currency.  
I think that we are fairly entitled to ask:  
1st.—That the government shall declare  
in what tael the customs and other dues  
payable by foreigners are to be discharged.  
It appears from Prince Kung's despatch that  
the action of provincial officers in demanding  
such payments by a higher scale than the  
Kuping is a departure from the established  
rule of the government in regard to the re-  
ceipt and disbursement of the public  
moneys.

2d.—The standard tael having been de-  
cided upon, its exact equivalent in grains  
troy and grams should be declared.  
Looking to the inferiority of native scales,  
there can be no certainty in passing bullion  
until this has been done.

3d.—The purity of the silver of the stand-  
ard tael should also be declared. There is  
no such thing in China or elsewhere for  
that matter as silver 1000 fine, and it is  
necessary to have a standard purity de-  
clared, not only in order to effect certainty  
in passing bullion, but also in determining  
the equivalent values of the foreign coins in  
circulation.

4th.—The values of local taels relatively  
to the standard tael should be restated and  
declared.

5th.—The values of foreign coins should  
be restated and declared.

It is not necessary, as I think, to enter  
upon an extended argument to show that  
the steps mentioned above are of much im-  
portance, or to explain why silver only is  
spoken of. All that has preceded in this  
paper indicates that silver is the real stand-  
ard of value in China, that much uncertainty  
exists in its use, and that if effort is to be  
made to improve matters without a radical  
departure from the existing system the sug-  
gestions made are perhaps those which, if  
carried out, would offer the best results.

It is not necessary either to point out the  
treaty stipulations which would justify the  
effort to effect such an improvement of the  
currency. When foreign nations agreed with  
China for the payment of duties upon  
merchandise imported and exported by their  
people, it is not to be supposed that they  
imagined that the unit of the currency was  
an unknown quantity, or that they can be  
satisfied to have a situation continue which  
does not give uniform results.

It is desirable, of course, to proceed  
toward the accomplishment of reforms in  
this country, or in any other, within existing  
lines of administration. Perhaps a leading  
merit of the suggestions advanced lies in the  
fact that it would not be necessary to bring  
any new instrument of administration into  
use. It would be quite possible for this  
government to direct its provincial officers to  
take steps, in concert with the foreign  
customs establishment, to bring about all  
the reforms indicated.

There can be no doubt, moreover, that  
steps so taken would prove an advance  
toward the ultimate object. They would  
expose more clearly the faults of the exist-  
ing system, and they would break down, in  
some measure, the interests which are up-  
holding it. All considerations then—those of  
the immediate interests of commerce, and  
those which look to the ultimate complete  
reformation of the currency to the advan-  
tage of all, to that of the native indeed, far  
more than to the foreigner—indicate that it  
will be wise to prosecute this business with  
all appropriate earnestness.

GEORGE F. SEWARD.  
PEKING, February 20, 1878.

**The Telephone on a Railroad.**—The  
Toronto (Ont.) *Monetary Times* says: A  
practical and somewhat important use of  
the telephone is being made at Amherstberg  
station of the Canada Southern Railway.  
The railroad company have a telephone wire  
under the Detroit River, from the upper  
slip on the Canada side to the Stony Island  
slip, for the greater convenience in com-  
municating orders for the movement of the  
ferry barges which are now used, towed  
by tugs, to transport laden cars, pending  
the repairs of their large steamer transfer.

**Flame Temperature.**—M. Rosetti, of  
Venice, has recently carried out some ex-  
periments to determine the temperature of a  
Bunsen flame. He used a thermo-electric  
apparatus. His estimate of the tempera-  
ture of a Bunsen burner is as follows:  
Exterior flame, 1350°, diminishing to 1200°  
at the dark central cone; interior of cone,  
top, 650°; bottom 250°. These figures are  
of the Centigrade thermometer, equivalent  
respectively to 2462°, 2192°, 1202° and  
482° F. The method of obtaining the es-  
timates can, however, give only approximate  
results.

For the week ending at midnight on Sat-  
urday, July 6th, 343 tons of iron were  
manufactured at the furnace of the War-  
wick Iron Company, at Pottstown. This  
number exceeds by three tons the largest yield  
of the Warwick Furnace in any previous  
week. The Warwick Furnace is a single

anthracite stack, 16 x 55 feet. It was built  
in 1875.

**The Recent Boiler Explosion at Cam-  
bridge.**

The report of the inquest into the facts  
connected with the boiler explosion at the  
factory of the Boston Stamping Company,  
in Cambridge, on Saturday, April 6, 1878,  
has just been rendered and contains points  
of considerable interest to manufacturers  
and users of steam boilers.

The boiler was of 50 horse-power, 17 feet  
long, 4 feet in diameter, and of the class  
known as a horizontal return tubular boiler.  
It contained originally 49 3-inch tubes—two  
of which had been removed—and from the  
great extent of surface exposed to the heat  
this boiler had a large capacity for generat-  
ing steam. It was made by Thomas Cun-  
ningham, and placed in the factory in No-  
vember, 1869, under the builder's direction.  
It was reported to be made of the best qual-  
ity charcoal No. 1 iron. It was tested by a  
pressure of 150 pounds to the square inch,  
and a certificate of a United States Inspec-  
tor of steam boilers given that it was deemed  
safe for one year at a working pressure of  
100 pounds to the square inch. At the time  
of the explosion it was inferred by one of  
the owners that not more than a tenth of  
the usual power of the boiler was at work,  
as the daily work had been suspended.  
Upon certain evidence it appears that at the  
moment preceding the disaster the strain  
upon the boiler did not materially exceed 60  
pounds to the square inch, and that there  
was no deficiency of water. When the ex-  
plosion occurred there was no warning or  
intimation of danger. It was instant, ter-  
rific and destructive. The building in which  
the boiler was set was totally destroyed, and  
the fragments scattered about as if a mine  
of gunpowder had exploded on the spot.  
More minute particulars of the disaster, by  
which the unfortunate men were killed, fol-  
low. One of them, besides being employed  
as a blacksmith, had had charge of the boiler  
since January last. He had no such educa-  
tion and experience as would qualify him  
for the responsible trust.

The evidence taken at the inquest disclosed  
the following defects in the materials and  
construction of the boiler:

1. The examination of the iron of the shell  
by thorough tests disclosed that, instead of  
being of the best quality, as represented in  
the certificate of inspection, it was of a  
very inferior kind, utterly unfit for a steam  
boiler. It showed indications that these  
plates had been rolled from two qualities of  
iron, an inferior central plate veneered by  
covers of a better grade, so that, while its  
tensile strength would sustain a strain that  
indicated safety, it was so brittle, as stated  
by Mr. J. H. Roberts, as to break under a  
slight blow with a 7-pound hammer.

2. The boiler had faults of construction  
that made it insecure. The rivet holes were  
too large, leaving the transverse seams par-  
ticularly very weak. The stays of the back  
head were all attached to the back course,  
thereby throwing the pressure upon the rear  
transverse seam. The same pipe was used  
both for feed pipe and as a blow-off pipe;  
the boiler was so set and fed that the cir-  
culation was defective, and there was no place  
for the safe deposit of sediment and no man-  
hole for its removal except at the front.  
There was no fusible safety plug.

3. It also appeared that the setting of the  
boiler was so faulty that soon after its erec-  
tion the whole of the bottom was exposed to  
the direct action of the fire, as also the dry  
smoke box, which was frequently burned out.

The report says it was shown by the con-  
current testimony of several experienced  
workmen who had examined and repaired  
this boiler, that from the action of the fire  
upon the front plates, from the frequent ac-  
cumulation of sediment in the back end,  
consisting principally of silicious fronds de-  
posited by the water used from Fresh Pond,  
by which the bottom sheets and the lower  
tubes were exposed to injury from the heat,  
and from the want of competent supervision  
and care, it had become unsafe a long time  
previous to the disaster. From the time of  
its erection in 1869 it does not appear that  
this boiler had been submitted to an inspec-  
tion beyond the incidental examination of  
the workmen employed to repair it. While  
the above enumerated defects as to the con-  
dition and care of the boiler were abun-  
dantly proved, yet the engineers and experts  
who had investigated the facts of the case  
were not uniform in their opinion as to the  
immediate cause of the explosion.

That part of the report which follows, as  
published by some of the Boston papers, is  
the veriest nonsense, possibly from some  
misunderstanding of the reporters. It  
seems evident, however, that the boiler had  
been standing a long time under pressure  
and making little or no steam. Upon the  
opening of a valve or cock the pressure was  
probably sufficiently lowered to release the  
enormous supply stored up in the water and  
so produce the destruction. The report con-  
cludes as follows:

"Had the original inspection discovered  
the inferior quality of the iron, this boiler  
had probably never been accepted. Had it  
been submitted to competent inspection, it  
would undoubtedly have been condemned  
long ago. Had it been placed under the  
care of a competent engineer—and no one  
can be deemed competent who is unac-  
quainted with the chemistry and phenomena  
of steam—the conditions which directly  
brought about the disaster would not have  
been allowed to occur."

"We find there was grave delinquency in  
using iron in the construction of this boiler  
totally unfit for the purpose. This defect  
was a latent, ever-present source of danger,  
and contributed in a large degree to its de-  
struction. We find there was inexcusable  
neglect in permitting the boiler to be erected  
and used to the peril of all persons in its  
neighborhood, without the proper appliances  
and means for its security, and without any  
survey by a competent inspector long after  
its unsafe condition had become apparent."

"We find that the explosion which caused  
the death of the said deceased resulted from  
the superheating of the water in the boiler  
under the conditions herein described."  
The verdict will probably be made the basis  
of civil suits against the owners of the boiler  
by the relatives of the persons killed.



## Iron.

## HOLLOW CHILLED ROLLS.

U. S. PATENTS, Nov. 9, 1869, and Oct. 9, 1877. ANY REQUIRED DIAMETER OR LENGTH.



Suitable for Plate, Sheet, Nail Plate, Pipe Iron, Bridge Iron. Either Iron or Steel Rolling.

TOTTEN & CO., Fulton Foundry, Pittsburgh, Pa.,  
Manufacturers of Rolls and Rolling Mill Machinery of every description, will receive prompt attention.

As convincing proof of their great superiority we refer to the following testimonials of practical men:

BELLAIRE, OHIO, Feb. 4, 1878.  
We take pleasure in saying that we have used your Hollow Chilled Rolls for 12 months, and find them to be the best rolls we have ever used in our mill. The rolls keep very much cooler and save grease and steam, and we can expand the body of Roll very much better than we can the solid Roll. We will order another pair as soon as we start our mill.

BELLAIRE NAIL WORKS,  
A. L. WETHERAL, Manager.

BELLAIRE, O., Dec. 30, 1877.  
I think your Rolls are just what you claim for them. The iron in them is fine and good, and the chill is even all over alike. They are the best for nail plate I ever worked. I can run a set of them three months without dressing, and make as good surface and good edges as you see on hoops, and they are ready to work fine iron at any time without change.

JAS. PATTERSON, NAIL PLATE ROLLER.

PITTSBURGH, April 6, 1878.  
I have tried the Hollow Chilled Rolls for sheet steel for twelve months, and believe them to be in every way superior to solid rolls. They keep their surface and produce handsome work. They do not heat in the necks. Your Solid Rolls on small mill for steel wire, &c., also give us great satisfaction, combining surface and strength.

DAVID SHAW,  
Manager for ANDERSON & PASSAVANT.

LA BELLE STEEL WORKS, April 10, 1878.  
We have been using the Hollow Chilled Rolls for a year, and are more pleased with them than the solid; have no hot necks or "springing" rolls, with less number of dressings, and are now free from colweb checks or cracks on face we were so much troubled with in our solid rolls.

SMITH, SUTTON & CO.

CRESCENT STEEL WORKS, April 11, 1878.  
We have used several pairs of your Hollow Chilled Rolls. One pair ran until we dressed all of the chill off; the others are still in use and doing well.

MILLER, METCALF & PARKIN.

CONSHOHOCKEN, PA., April 11, 1878.  
In reply to your favor of 9th, we have to say that the Hollow Rolls made by you, and on which we are now making Sheet Iron, are giving good satisfaction.

The work we are doing on these Rolls is of the very hardest kind, and tests rolls more severely than almost any other kind of work, making sheets Nos. 15 and 20, 5 to 9 feet long at one heat, from a bar 4 1/2 in. wide. They are good hard surface, and even chill, and are still perfect after 6 months' use. We think these Rolls are superior to any we have now in use.

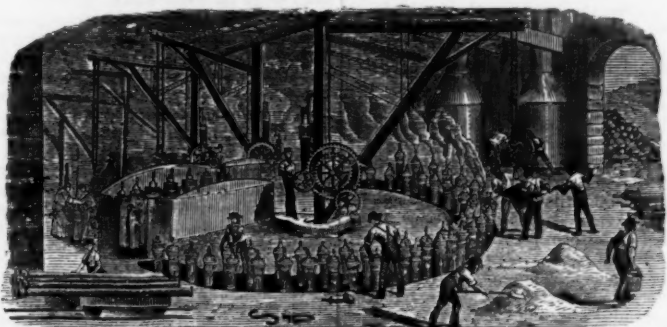
J. WOOD & BROS.,  
Manufacturers of Russian Sheet Iron, &c.

CATAZAUQUA, Pa., April 11, 1878.  
The Hollow Chilled Plate Rolls received from you last summer have given us entire satisfaction, and if we were in need of Plate Rolls to-day we would order another pair just like the last. When we need pair you will hear from us.

CATAZAUQUA MFG. CO.  
OLIVER WILLIAMS, General Manager.

## McNEALS &amp; ARCHER.

BURLINGTON, N. J.



## CAST IRON PIPES

FOR WATER AND GAS.

## Light Castings and Metal Patterns

A SPECIALTY.

## TAYLOR &amp; BOGGIS,

Iron Founders,

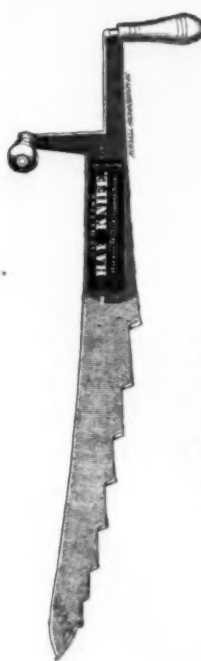
Nos. 65, 67, 69, 71 &amp; 73 Central Way, CLEVELAND, O.

CORRESPONDENCE SOLICITED.

Will make estimates on completed work when desired.

## LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt &amp; Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

## Southern Advertisements.

## Southern States Coal, Iron &amp; Land Co.

LIMITED,

ENGINEERS, IRON FOUNDERS & BOILER MAKERS,  
Coal Miners and Fire Brick Manufacturers.

The Only Makers in the Southern States of

WASHED FOUNDRY COKE,

Free from Slate and Sulphur.

Machine-Made Brick, Limestone, Lumber and Shingles.

FARMS TO LET.

Apply to the HEAD OFFICE, South Pittsburg, Tennessee.

## W. A. HOSKINS,

DEALER IN

## MINERAL LANDS,

Chattanooga, Tenn.

Offers for sale, at very low figures, some of the most valuable Charcoal and Coke Properties within the district. Full particulars furnished on application.

## Vulcan Iron &amp; Nail Works,

Chattanooga, Tenn.,

MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE  
AND CAR BOLTS, AND FORGINGS GENERALLY.

## ROANE IRON COMPANY,

Manufacturers of and Dealers in

## Pig and Railroad Iron.

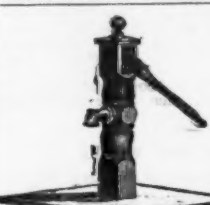
CHATTANOOGA, - - - - - TENN.

## WASON CAR &amp; FOUNDRY COMPANY,

Chattanooga, Tenn.,

Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.



## SOUTHERN PUMP &amp; PIPE CO.,

MAKERS OF

Plain and Porcelain Lined Pumps.

Patent Improved Rubber Bucket Chain Pumps.

Pump Material in the rough or in the white. The very best quality of work at lowest prices.

CHATTANOOGA, TENN.

## TENN. COAL &amp; RAILROAD COMPANY,

A. M. SHOOK, General Manager, - - - Tracy City, Tenn.

Proprietors of the Sewanee mines, capacity of 50,000 bushels of coal and coke per day.  
Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad.  
Being also the proprietors of several extensive tracks of very fine lands, offer special inducements to colonies. Communications addressed to the General Manager will receive prompt attention.

## T. J. BROWN,

Rockwood, Tenn.

Miner and Contractor of  
Fossiliferous Ores.

A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

## S. B. LOWE,

Pig Iron, Storage &  
Commission.

Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes.  
Chattanooga, Tenn.

## S. Whinery, Civil Engineer,

CHATTANOOGA, TENN.

Late Division Engineer Cincinnati Southern Railway.  
Will prepare plans and superintend construction of Bridges, Buildings, Roofs, Roads, Streets, Water Works, Sewers, Canals and other public works. Examinations, location and construction of railway lines a specialty. Surveys, examination and reports made of mineral lands. Business attended to thoroughly and promptly. First-class references given.

## GEORGE W. BRUCE,

No. 1 Platt St., New York,

Agent for CLEMENT & MAYNARD,  
Great inducements offered in their Superior Shovels, Spades and Scoops and Trowels, as well as Hoes. A large stock on hand.

## CHAMPION BARROWS.



WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin for dealers. W. are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SEMPLER &amp; BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

For Sale by THE NEW YORK FLOW CO., General Eastern Agents, 55 Beekman St., New York.

## STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF

HOT PRESSED

Square &amp; Hexagon Nuts,

R. R. FISH BARS,

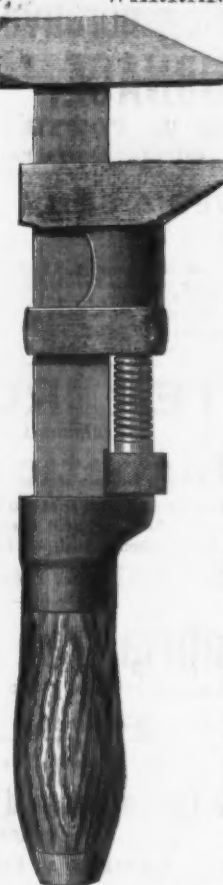
BOLTS.

SPIKES,

RIVETS, &amp;c.

STANDARD  
GIRARD WRENCH.

WARRANTED.



FOR  
STRENGTH  
AND  
Durability  
IT HAS  
NO SUPERIOR.  
—  
GUARANTEED  
IN  
EVERY RESPECT.

Wrought Bar, Head  
and Screw.

Owing to the increased demand for these justly Popular Wrenches, we are now manufacturing more than any other establishment in the world.

Our Wrench having been imitated by other manufacturers, we have adopted the above Trade Mark, and will hereafter stamp all our goods.

SEND FOR  
TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

## SCOOPS

Hubbard, Bakewell &amp; Co., A

O PITTSBURGH, W

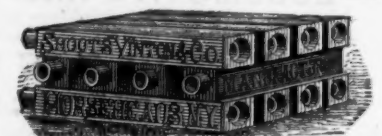
V PENN. S

E BEST BRANDS. A

L N

SAXES D

Send for price list.



## SHOOTS, VINTON &amp; CO.,

Manufacturers of

## Wooden Water Pipe,

And all kinds of Chain Pump Tubing

(J. D. Shoots' Patent, July 3d, 1877.)

J. D. SHOOTS,  
C. E. VINTON,  
S. H. CONKLING,  
R. COLWELL.

FACTORY:

Horseheads, N. Y.

The above Patent for sale for all States except New York and Pennsylvania.

OLD  
BOOTS  
AND  
SHOES

Can be Straightened  
AND NEW ONES KEPT STRAIGHT  
BY USING

LYON'S PATENT  
Metallic

## HEEL STIFFENER.

Send for a new Illustrated Price List for 1878.

Sole Manufacturer,  
N. LYON, ALBANY, N. Y.

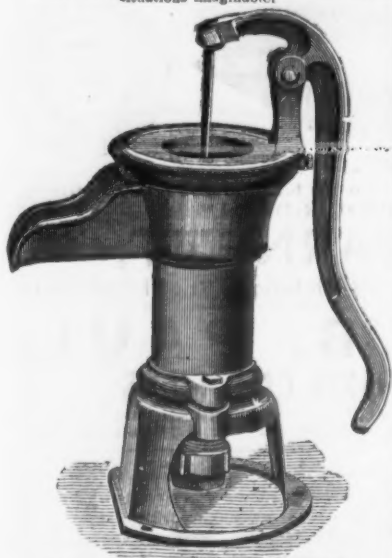
## Stove Repairs.

Repairs for Stoves made at Troy, Albany, Rochester, Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago, Milwaukee and elsewhere, at

127 W. Bond  
W. C. METZNER,  
CHICAGO, ILL.



The Largest Pump Works in the World.  
Over 800 Different Styles.  
PUMPS, STEAM PUMPS, ROTARY  
PUMPS, CENTRIFUGAL PUMPS,  
PISTON PUMPS,  
Tanners, Paper Mills, Fire Purposes, suitable for all  
situations imaginable.



Also, HAND FIRE ENGINES.  
Send for Catalogue. Address,  
**RUMSEY & CO.,**  
Seneca Falls, N. Y., U. S. A.  
Branch House, 93 Liberty Street, N. Y.  
MARCUS C. HAWLEY & CO., San Francisco and  
Sacramento, Cal., General Agents for the Pacific Coast.  
JUSTUS SCHMIDT, Agent, Hamburg.  
**L. M. RUMSEY & CO.,**  
Branch House, 511 N. Main St., St. Louis, Mo.

**AGATE IRON-WARE**  
PATENTED  
May 30th, 1876, Feb. 27th, 1877, July 31st, 1877.



The absolute Purity and Safety of  
Agate-Iron-ware is certified to by the  
following eminent Chemists:  
R. OGDEN DOREMUS, M. D., LL.D., of College of the City of N. Y.  
S. SILLIMAN, State Chemist, Yale College, New Haven, Conn.  
HERBERT G. TORREY, U. S. Assayer, Office, 20 Wall St., N. Y.  
S. C. EATON, M. D., Analytical Chemist at U. S. Assay Office.  
S. DANA HAYES, State Assayer and Chemist, Boston, Mass.  
HENRY MORTON, Prof. Stevens Inst. of Technology, Hoboken, N. J.  
EDWARD S. WOOD, Prof. Chem., Harvard Med. Coll., Boston, Mass.  
WM. RIPLEY NICHOLS, Professor Gen. Chemistry, Boston, Mass.  
BOOTH & GARRETT, Practical & Analytical Chemists, Philadelphia.



Price Lists and Discounts will be sent only to  
the Trade, on application.  
**LALANCE & GROSJEAN MFG CO.,**  
P.O. Box 301, 89 Rockman St., New York.

**PERRY & CO.'S STEEL PENS**  
A sample card containing  
our leading styles  
mailed on receipt of 25c.

IVISON, BLAKEMAN, TAYLOR & CO., Sole Agents for the U. S.  
135 and 140 Grand St., New York.  
**PERRY & CO., Ltd., London.**  
119 & 114 William St., New York.

**HOWSON'S**  
OFFICES FOR PROCURING  
UNITED STATES AND FOREIGN  
**PATENTS,**  
Forrest Buildings,  
119 SOUTH FOURTH ST., PHILADELPHIA  
AND MARBLE BUILDINGS  
605 Seventh St. (Opposite U. S. Patent Office),  
Washington, D. C.

H. HOWSON, Solicitor of Patents, C. HOWSON, Attorney at Law.  
Communications should be addressed to the  
PRINCIPAL OFFICES, PHILADELPHIA.

For European  
and particularly  
German  
Patents  
apply to  
**Lenz & Schmidt**  
Patent-Attorneys,  
78/79 Dorotheenstr.  
Registration  
of Trade-Marks  
**BERLIN, N. W.**

**PATENTS.**  
THOMAS D. STETSON, 93 Murray St., N. Y.,  
Patent Solicitor and Expert.

**W. & B. DOUGLAS,**

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

**PUMPS,  
HYDRAULIC RAMS,  
GARDEN ENGINES**

Yard Hydrants, Street Washers.

AND OTHER

**Hydraulic Machines**

IN THE  
WORLD.

Awarded the GRAND MEDAL of PRO-  
GRESS at WORLDS' EXPOSITION, VIEN-  
NA, 1873, being the highest awards on  
Pumps, &c., also, highest medal at PARIS  
in 1867, and Philadelphia, 1876, accom-  
panied by Report of Judges.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, ILL.



**UNION MANUFACTURING COMPANY,**

Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

**Cast Fast & Loose**

Drilled and Wire Jointed.  
Japanned, Figured, Enamelled, Nickel Plated  
and Real Bronze Butts. Also a full line of

**IRON & BRASS PUMPS,**

(Garden, Well, and Force Pumps, Yard, Drive  
Well, Garden Engine and Steam Roller Pumps,  
Hydraulic Rams, etc., and all with the most modern  
improvements.)

**Centennial Spring Hinges.**

This Hinge has two flat coil  
springs, very powerful. It has a heavy  
solid pintal, giving much less fric-  
tion than a hollow pintal. It has  
broad, solid bearings in the knuckle,  
which do not wear down readily and  
let the door sag. It is Fast Joint,  
therefore can be used for either right  
or left hand. By actual test it has an  
average of 30 per cent. more power  
than other Spring Hinges in common  
use of same size.

15 Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,

98 Chambers St., N. Y.

67 Kilby St., Boston, (Pumps.)

Heaton & Denckla, 507 Com-  
merce St., Phila. (Butts.)

Send for Illustrated Catalogue  
Price List.

**THE IMPROVED  
HOWE SCALES**

In Competition with the World at Philadelphia, 1876.

**TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT**

The following are the points that the Judges officially announce as the basis of their award of the  
highest honors to the Howe Scales:

- 1st. For their Protected Bearings (the Howe is the only Scale with Protected Bearings), which makes  
the Scale **DURABLY ACCURATE.**
- 2d. For their Strength.
- 3d. For their Simplicity.
- 4th. For their Economy in Construction.
- 5th. For their first-rate Material and Workmanship.
- 6th. For their various original Improvements and Adaptations (which being patented are exclusively  
possessed by the **HOWE**).

**The Improved Howe Scales**  
MADE BY THE  
**BRANDON MFG. COMPANY, of Rutland, Vt.,**  
Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago; 116 Main St., Cin-  
cinnati; 157 Water St., Cleveland, O.; 612 N. Third St., St. Louis.  
PRIEST, PAGE & CO., 325 Broadway, New York.  
" " " " 213 Market St., Philadelphia.  
" " " " 145 Franklin St., Boston.  
" " " " 63 Wood St., Pittsburgh.  
PARKHURST & CO., San Francisco, Cal.  
FROTHINGHAM & WORKMAN, Montreal, Canada.

**YALE LOCKS.**  
**YALE LOCK MFG. CO.,**

Stamford, Conn., U. S. A.

SALESROOM, 53 Chambers Street, New York,

#### A Consular Report from Denmark.

Mr. Henry B. Ryder, our consul at Copen-  
hagen writes to the State Department as  
follows:

Agricultural laborers here are paid 1 38-100  
crowns\* per day; but as the rule farm hands  
are employed at from 8 to 10 crowns per  
month, including board and lodging. Me-  
chanics earn on an average from 2 to 3  
crowns per day. Laborers on public works,  
such as railways, &c., earn from 500 to 600  
crowns per annum, without board.

I may here add that there is a large sur-  
plus of labor at the time of this writing,  
May 15, 1878, and no employment for it.

#### COST OF LIVING.

The cost of living to the laboring class in  
this city is on an average, for a grown per-  
son, at from 1 to 2 crowns per day; for a  
family of two adults and three children,  
from 2 1/4 to 3 crowns per day. For the  
country and provincial cities the cost of liv-  
ing to the laboring class is less, say about 1  
crown per day for an adult, and from 1 1/4 to  
1 1/2 crowns per day for a family of two  
adults and two children.

Wages are, on an average, from 10 to 15  
per cent. lower than in 1872. I may here  
state that during the past years, including  
1873 to 1876—of which no official reports  
pertaining to this matter can be obtained—  
wages were considerably advanced, say  
from 35 to 45 per cent., on an average, on  
all classes; but in 1877 a general reduction  
commenced, which has brought down the  
cost of production and labor to nearly the  
same figures as in 1872. The cost of living  
is about the same now as in 1872, if not a  
trifle higher.

#### STATE OF TRADE.

The present state of trade in this country  
is very much depressed in every line of  
business. On looking for the cause of this  
general depression I find that there have  
been several aggravations which have helped  
to bring about the present state of affairs,  
namely, a seriously unfavorable harvest in  
1876, 1877 and 1878, overspeculation and  
extreme uncertainty of all European politics.  
Commercial distress may be explained in the  
following manner: The production and over-  
speculation in a large class of important  
commodities requiring extensive capital and  
many workmen is so much in excess of the  
real demand as to reduce the prices and leave  
no profit to the merchant or producer. In  
other words, the less wealthy are compelled  
to retire from the field, ruined, and the  
wealth of the country is lessened by the  
aggregate of the capital they have lost, and  
by the cost of maintaining in some way or  
other the many workmen thrown out of em-  
ployment. In this small country the cash  
demand for commodities has fallen off to a  
considerable extent, because from some  
cause the means of the consumers have con-  
siderably diminished, and in consequence of  
a larger amount of capital being applied to  
production or speculation than the actual  
wants of the country would justify.

The means of consumers have been less-  
ened here since 1874 from the following  
causes: 1. From great losses to investors in  
stocks and private enterprises, &c., which  
in annual income amounts to many millions.  
2. From losses incurred in trade. 3. From  
losses incurred by the maintenance of many  
workmen unable to procure employment.

It is very certain that the means of con-  
sumers, whether in this or in other coun-  
tries (that is to say, the cash demand for  
commodities), can only be augmented by  
great frugality, harder work and more in-  
vention, unusual productiveness of the soil  
and the accumulation of savings over a con-  
siderable period of years. It is not a matter  
of confidence or credit, but a want of cap-  
ital. Trade has been depressed here since  
1874 because there has been year by year  
little or no surplus of earnings over ex-  
penses, and trade will continue to be de-  
pressed until that surplus becomes consider-  
able.

#### LABOR IN DENMARK.

Another evil more radical in its nature is  
the diminished value of labor—that is to say,  
the descending quantity and quality of work  
obtained by employers for wages not merely  
the same, but higher than they were ten or  
twelve years ago. This is a cause of dear-  
ness of production and of retarded accumu-  
lation of the most formidable character, to a  
great extent neutralizing the gain to the  
community from the increase of skill and  
the progress of mechanical inventions. Its  
effect on an entire country—if there are no  
sufficient compensations in the progress of  
inventions or in other directions—is essen-  
tially as disastrous as would be a material  
reduction of the hours of daylight. After a  
lapse of time, and that not a very long one,  
the severest and most hopeless sufferers by  
such a limitation of efficiency and progress  
are the working classes themselves. There  
can be no advancing welfare among the  
class of working people depending on weekly  
wages apart from the rapid accumulation of  
capital.

#### DANISH CURRENCY.

On the 30th of April last about 64,000,-  
000 of paper money (crowns) were in cir-  
culation. On the other hand, the amount of  
gold coin and bars at the National Bank  
of this city, for the security and redemp-  
tion of said paper currency, was 35,500,000  
of crowns. The national bank of Copen-  
hagen is the only bank in this kingdom  
allowed to issue paper money, none being  
issued by the government or by any other  
bank in Denmark. The notes of the Na-  
tional Bank are redeemable in gold coin,  
which is the legal tender; silver being used  
as fractional currency, and only considered  
legal tender to the amount of 20 crowns.

According to treaty stipulations between  
Denmark and Sweden-Norway, the coins  
of the three countries are circulated in each  
of them as legal tender.  
It is impossible to give an exact statement  
of the amount of the gold coin in circulation  
in the kingdom of Denmark, but, including  
the amount held by the National Bank of  
this city, it may be said to be 30,000,000  
crowns. The circulation of silver amounts  
to about 16,000,000 crowns, and the amount  
of copper in circulation to 500,000 crowns.

#### BUSINESS METHODS.

Regarding the business habits and sys-  
The Danish crown is worth 37 cents.

tems of the commercial classes in this  
country, as far as I have been able to form  
an opinion I should say that most of the  
Danish merchants are honorable and re-  
spectable. Not only is this opinion enter-  
tained of them at home, but it is shown to  
exist abroad in the widespread credit  
which is accorded them in all countries in  
Europe, namely, England, France, Ger-  
many, Russia, Holland, Belgium, Sweden  
and Norway. The general character of the  
merchants is that of strict probity in their  
transactions; but they are somewhat slow in  
their movements, and difficult to be got to  
step out of their old steady way of carrying  
on their business transactions. More espe-  
cially do the wholesale merchants—as also a  
considerable class of the retailers—appear to  
be held in the highest estimation, and it is  
but very rarely that such confidence seems  
to have been misplaced, as in the whole  
manner of transacting business their chief  
desire seems to be the maintenance of the  
credit and high standing of their firms by  
a strict fulfillment of their engagements.

#### CREDITS.

Although a considerable part of the trans-  
actions are for cash payments—that is to  
say, from 3 to 30 days—the usual terms are  
90 days, with or without bill acceptance,  
and in many instances, more especially  
among the small retail dealers in the provin-  
cial towns, by an extension of credit six  
months. The style of the trade carried on  
with England, chiefly in manufactured goods,  
is on credit against remittance at the expira-  
tion of three months from date of ship-  
ments. The principal exports are chiefly  
made against direct orders for shipment,  
consignments on merchant account being  
seldom made. With live cattle, of which  
some 50,000 head are annually exported, I  
believe it is different, and that a large pro-  
portion of these shipments are made on  
speculation. The preceding remarks have  
reference only to the honorable and respect-  
able class of dealers, for naturally here, as  
well as in other countries, will be found  
some few who, looking less to their good  
name, will sacrifice the same for the sake of  
procuring some temporary profit. Notwith-  
standing the increased facility of credit—  
created by many years of considerable over-  
speculation in every branch of business and  
obtained by incompetent and insolvent trad-  
ers and merchants—has tended to increase  
the number of bankruptcies, still these,  
when compared with what has taken place in  
other countries, are small in extent, and it  
is chiefly among this class of traders that  
the general and widespread stagnation seems  
most to exist.

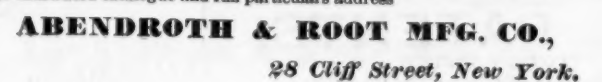
The St. Gothard Railway Company finds  
some difficulty in obtaining the money nec-  
essary to complete its great work. According  
to the original understanding under which  
the work was begun, Italy was to have con-  
tributed \$9,000,000; Switzerland, \$4,000,000;  
the North German Confederation, \$2,000,-  
000; the Grand Duchy of Baden, \$600,000;  
and the other German States the additional  
cost. Now Switzerland is asked to contrib-  
ute as a nation, instead of by states,  
\$1,300,000, on condition that the Northern  
and Central Railway Company gives \$300,-  
000 more, which, it is estimated, will com-  
plete the road. Whether these subsidies are  
in addition to those originally agreed upon  
does not appear in the dispatch. The road  
will connect Luzerne and Milan by rail, and  
the division of cost between the nations is  
supposed to be derived by each from its construc-  
tion. It now requires 15 hours to cross the  
Alps by the St. Gothard pass in the diligence  
from Fluelan to Bellinzona.

The British Consul at Havre writes:  
France is singularly free from the exigen-  
cies of trade unions and the pernicious  
effects of strikes. The great mass of French  
workmen, outside of a small class of café  
politicians in Paris, keep, no matter what  
their political opinions may be, their atten-  
tion fixed on the one main chance—that of  
earning money. Their amusements are  
more simple, their habits and mode of living  
less costly, and they are more saving than  
the British workmen. Nor are their powers  
of labor much inferior. In anything requir-  
ing muscular effort they cannot compete  
with the Englishman; but in the manage-  
ment of machinery they are quite if not  
more effective; for, while both intelligent  
and neat in his work, the iron and cotton  
factory hand will attend to two machines  
where the Englishman, hampered by the  
rules of his union, will refuse to look after  
more than one.

The Cincinnati Gazette describes a plan in  
use in that city for consuming the smoke of  
furnaces of steam boilers. There are, it  
says, two fires, one under each end of the  
boiler, fed from the side. When one fire is  
fairly burning the second fire is kindled, and  
by shifting the draught the smoke from the  
new fire is carried over the live coals in the  
furnaces first started, and is consumed. The  
fires thereafter are replenished alternately,  
and thus the consumption of smoke is con-  
tinued. The device is in operation on a  
large scale in the steam furnace of a heavy  
engine attached to one of the inclined plane  
railways that lift Cincinnati people to the  
tops of the surrounding hills. The result, as  
vouched for by the proprietor of the concern,  
is that the consumption of smoke is com-  
plete, and the saving of fuel about 40  
per cent.

Garland is a town on wheels. Whenever  
the Denver and Rio Grande Railroad finishes  
a section of road the town moves to the end  
of the line. The people of Garland are de-  
termined to live at the terminus of the narrow  
gauge, no matter where it takes them. As the  
line will be extended to Alamosa next week,  
the festive Garlanders are now preparing to  
pack up and move—or dust as they put it.  
The houses are being taken down in sections,  
and in a week or ten days the present site  
of Garland will be deserted both by friend  
and foe. Garland was built in a week, and  
at one time had about 1000 inhabitants. It  
is a healthy place; it was located about one  
year ago, and there have been but seven  
deaths.

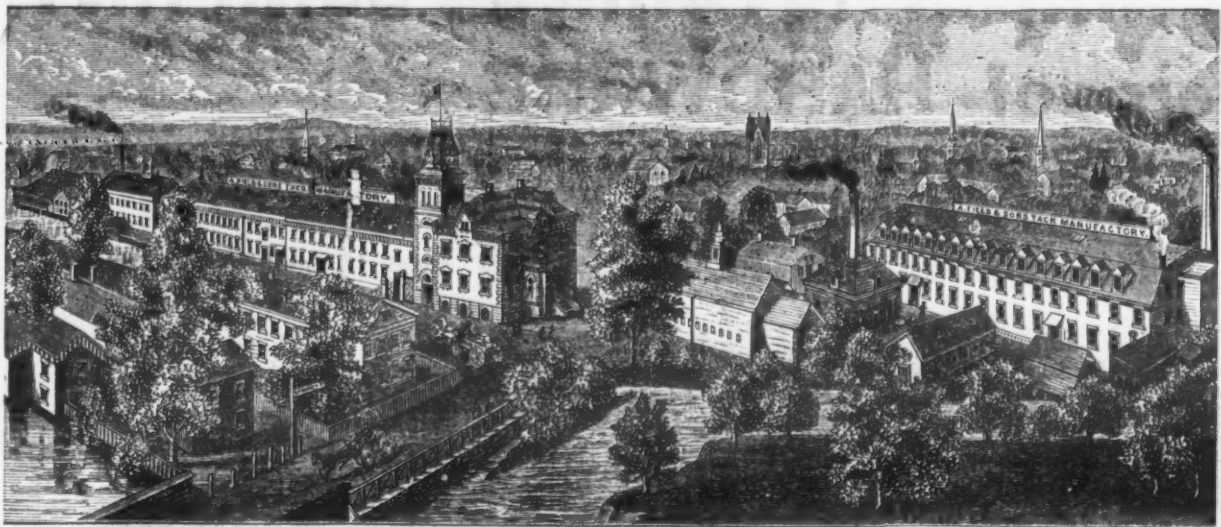






# A. FIELD & SONS,

## TAUNTON, MASS.



MANUFACTURERS OF

## TACKS OF ALL KINDS.

Shoe Nails, Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 75 CHAMBERS STREET, N. Y., where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from samples to order.

## Hoisting Machinery

MANUFACTURED BY  
CRANE BROTHERS MFG. CO.,  
Chicago.



### IRON CLAD Ice Balance.

300, 300, 400 lbs.

Capacity.

CORRECT,

COMPACT,

and

DURABLE.

NOT LIABLE TO GET OUT OF ORDER.

Universally Approved BY THE

Ice Companies.

Manufactured only by

John Chatillon &amp; Sons,

89, 91 &amp; 93 Cliff St.,

NEW YORK.

## Geo. M. Eddy & Co.,

351 & 353 Nassau Ave., Brooklyn, N. Y.  
Manufacturers of

## MEASURING TAPES.

Of Cotton Linen and Steel.

For all purposes for which Tape Measures are required.

Only manufacturers of

Paine's Patent U. S. Standard Steel

Measuring Tapes,

Pat. Spring Measuring Tapes

of Linen and Steel.

FINE TEMPERED STEEL SPRINGS.

FINE TEMPERED STEEL BAND SAWS.

From 1/4 inch wide upward. Warranted together than any other Band Saw. Catalogues on application.

## PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris,

1867; Moscow, 1873; Vienna, 1873, and only

Award and Medal for Self-Coiling Steel

Shutters at Centennial Exhibition,

Philadelphia, 1876.

## CLARK & CO.,

ORIGINAL INVENTORS AND SOLE

PATENTEES OF

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

## Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best and Cheapest** in the world. Are fitted to new *Tribune* Building, Lenox Library, Delaware and Hudson Canal Co.'s Building, Transatlantic Steamship Co.'s new Dock, American News Office, &c., Posey County Court House, Mt. Vernon, Holt County Court, Oregon, Mo. Also to buildings in Boston, Cincinnati, Detroit, Janesville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are endorsed by the **Leading Architects of the World.**

Office and Manufactory,  
162 & 164 West 27th Street, N. Y.

## ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass &amp; Copper Co.

Office, 19 & 21 Cliff Street,  
NEW YORK.

Cut Showing Round Platform.

Section Showing Edge.

## ANSONIA Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or Shield, as shown in the illustration, is especially designed for the safety and protection of walls, furniture, woodwork, paper or varnish from heat. Being constructed of metal, with firm and substantial edges, curved in form to stand alone, it may be easily adjusted to any position about a stove, before a grate or fire place. The demand for something useful, durable and ornamental as a Fire Screen has long been felt, and having finally accomplished the desired result, we are prepared to fill all orders promptly.



## CHAINS UNION CHAIN WORKS,

REITER & MORTON,  
Pittsburgh, Pa.,

Manufacture all kinds of

Coil, Cable, Crane, Railroad, Wagon and Agricultural Chains,  
From Best Standard Brands of Iron.

Our Chains are all thoroughly tested and warranted, and will be found equal to the best of either home or foreign make.

Prices the very Lowest.

## PHILIP S. BIGLIN,

Successor to W. F. SHATTUCK &amp; CO.,

Manufacturers' Agent for

## AMERICAN HARDWARE,

100 Chambers St., New York.

Shattuck's Union and Counter Scales.  
Phelan's Axes, Hatchets, Picks, &c.  
Wellman's Gimlet, Gimlet Bits, &c.  
Girard's Axes, Anger Bits, &c.  
Holroyd & Co.'s Stocks and Dies.  
Yaw's "Genuine" Wrought Iron Belts.  
Barton's Hand and Die Hells.

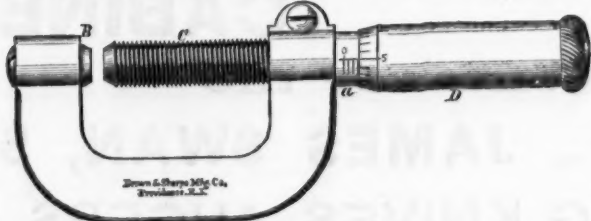
Maltby's Britannia and Cocon Dippers.  
Eddy's Reduced Lamp Black.  
"Eagle" Axe, Pick and other Handles.  
"Eureka" Flint, Sand and Emery Papers.  
Cortland Forged Horse Nails.  
Tackle Blocks, Spokes, &c., &c.

### REDUCTION IN PRICES OF

## Micrometer Calipers and Pocket Sheet Metal Gauges

MADE BY THE

BROWN &amp; SHARPE MFG. CO., Providence, R. I.

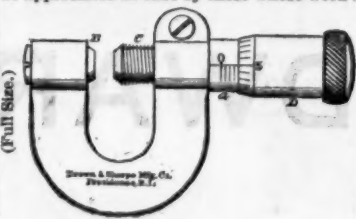


### MICROMETER CALIPER for Machinists' Use.

Price, \$5.00.

In Morocco Case, \$5.50.

For all sizes less than one inch diameter, this Caliper will be found a reliable and convenient substitute for the Vernier Caliper, and will prove invaluable to tool makers, and to machinists engaged on small and fine work. Its accuracy and convenience for the purposes for which it is designed will be appreciated at once by those whose work requires such a tool.



### POCKET SHEET METAL GAUGE.

Price, \$5.00. In Morocco Case, \$5.50.

This Gauge will measure the thickness of sheet metal or other material by thousands of an inch up to three-tenths of an inch at any point within half an inch from the edge, and can be applied as easily as the common gauge. It will also answer to measure the diameter of wire. Means of adjustment are provided in case of wear by continued use.

## The Boiler Explosion at the Chesapeake Nail Works.

Office of the HARTFORD STEAM BOILER  
INSPECTION AND INSURANCE COMPANY,  
HARTFORD, Conn., July 8, 1878.

To the Editor of the Iron Age.—Having seen mention of the explosion of the boilers at the Chesapeake Nail Works, near Harrisburg, in *The Iron Age*, it occurred to me that a brief communication from one who had made careful examination of the exploded boilers might be not only interesting to your readers, but of service to others owning boilers similarly set and used for like purposes. Diagram No. 1 will give an idea of the relative position of the boilers which exploded. They were plain cylinder boilers, 36 inches in diameter and 30 feet long, made of 1/4-inch iron. They were supported upon iron columns and suspended over puddling furnaces in the usual manner. The heaters and puddlers performed their duty below, while the water feeder occupied a platform above. The flues of the boilers marked Nos. 1 and 2 had been repaired, the brickwork being out of order, and had been out of use for several days. On the morning of the 25th of June (about 3.35 o'clock) the boilers marked Nos. 1, 2, 7 and 8 exploded with terrific force, completely demolishing the wing of the rolling mill in which the boilers were located and doing other and serious damage, as will be explained further on. The explosion occurred in the interim of a change of "turns." The night hands had all retired, and only a few of the morning "set" had arrived. Had the explosion oc-

75-feet

3 4

6 3

7 2

8 1

Rolling Mill

Diagram No. 1.

curring fifteen minutes later the loss of life would have been appalling. As it was, the water feeder, who was on his platform attending to his duty, as is believed, was instantly killed, and several others were seriously and two fatally injured. Diagram No. 2 shows the relative position of the buildings and the direction of the flight of the boilers. A great many theories have been advanced as to the cause of the explosion, as is usually the case. From a careful examination of the fragments of the boilers, no indications of special weakness could be found. The iron was thinned slightly on the bottom of the boilers, but not sufficient to cause any apprehension on account of the pressure used. The boilers were not overworked and were not strained. They were examined externally and internally twice each year, and no persons were more ready to have every defect, even the slightest, looked after and repaired at once, than Charles L. Bailey & Co. The portion of boiler marked C, near the store-house, had somewhat the appearance of burned iron from an external examination. The color of the iron indicated that the water had been

distillery, a stone building with walls 2 feet or more thick. They tore a large hole in the wall and were left projecting out as indicated at A, diagram No. 2. Boiler No. 1 passed along by the blacksmith shop, taking off part of its cornice, it then passed through the roof of the nail mill, and declining somewhat crashed into the store-house, through several piles of kegs of nails and out through an 18-inch brick wall, resting as shown at C. Boiler No. 2 sailed not less than 60 or 75 feet into the air, passed over the nail works and store-house, crashed through the ventilator of the new mill, fell into a vacant lot, rebounded and landed near a private dwelling. Its position when found is shown at D. It is not often that such destructive explosions occur. But they go to show that the best managed establishments are liable to destructive accidents sometimes.

Too much importance cannot be placed upon the matter of opening the steam ways between boilers which are under different pressures. Serious accidents not unfrequently occur from carelessness in this matter. The openings should be made very gradually, the steam being almost or quite "wire drawn" until equilibrium is established. The man who had charge of feed and steam connections had been in the employ of the company for many years, and is said to have been a sober, careful and faithful man. After careful examination I became satisfied that no blame could be attached to the proprietors. These boilers were insured by this company. They were inspected about six months before the explosion, and our inspector was in the neighborhood at the time of the explosion, with a view to making arrangements for another inspection. I should have said that boilers 3, 4, 5 and 6 remained undisturbed, with their stacks perpendicular and in good condition. This is a strange fact, when we consider that the portion of the mill in which they were located was entirely demolished.

J. M. ALLEN, President.

### Puddling by a New Process.

An Ohio paper says: An interesting experiment is being tried at Brown, Bonnell & Co.'s rolling mill in Youngstown. It is a patent process for puddling, and is the invention of the Rev. Dr. Chapin, a Presbyterian divine, who for several months filled the pulpit of the First Presbyterian Church in that place. A reporter who investigated the matter found in the new mill, suspended a dozen feet from the ground, a vast iron tank or vat, resembling, more than anything else in the world, a peanut roaster, except that it was mammoth in size. To the left of it was a great wheel, while a few feet in the rear was a sheet-iron tank at least 12 feet in height. This was an air reservoir, and the air was being pumped into the reservoir by a sort of an engine and pump, which was puffing away, making a terrible noise. A long pipe went from the reservoir to the big vat where the puddling was to be done. This pipe conveys the air into the vat, and in this way the blast was obtained. The reporter asked Mr. Richard Brown what the odd-looking vat suspended there meant. "Oh," said Mr. Brown, pleasantly, "that is something which, if it succeeds, will do away with the hot dollar, and strikes, and sliding scales, and all other such patents. It is an invention of Dr. Chapin, who is quite a chemist. He thought it might work, showed it to our firm, and we liked it so well we were willing to spend a little money to try it."

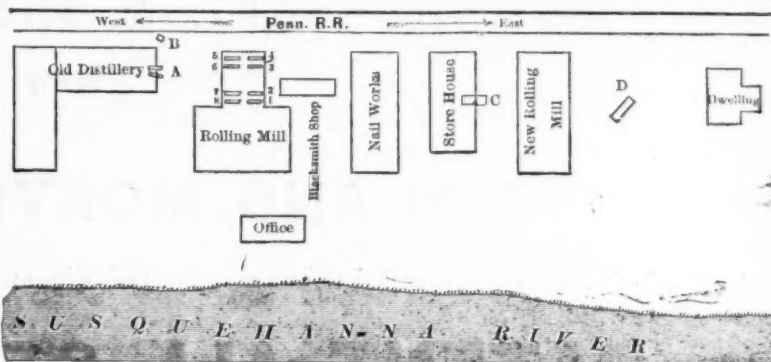


Diagram No. 2.

low, if not entirely out. Tests made by breaking the iron showed, however, a good degree of strength, and the fracture, while being a little brittle and dull, did not indicate so great a deterioration as one would infer from a surface examination. I have said above that the brick setting of the boilers 1 and 2 had just been overhauled. During this time they were of course cold and out of use. On the morning of the 25th of June the puddling furnaces were started up, and steam was being raised on the boilers. It was the custom when boilers were blown down for repairs to move the weight on the safety-valve lever in, and when the boilers were again put under steam to move the weight out to the point of maximum pressure. I should have said that all these eight boilers were connected with one main steam pipe. Just what the water feeder did while on the platform will never be known, but I am of the opinion that he opened the connections of boilers Nos. 1 and 2 before the steam in them had arrived at maximum pressure, or near it. The greater pressure of steam outside would cause a violent rush toward the point of least pressure, and a disturbance might be occasioned which would be sufficient to rend a boiler in pieces. Now, if in addition to this the water feeder had neglected to fill the boilers with water when the furnaces were started, and was engaged in that business at the time of the explosion, no other cause need be sought. What gives some probability to this theory is that a wrench which he was accustomed to use for such purposes was found near his body after the explosion.

Boiler No. 1 appears to have exploded first, and started off its companion No. 2. The breaking of steam connections caused such a sudden release of pressure that Nos. 7 and 8 were sent flying off toward the old

The reporter then asked to be enlightened as to how it was operated.

"Well," said Mr. Brown, "it is yet in a very crude state, but the idea is to put the molten iron into a vat, and, of course, with the blast blowing upon it it will decarbonize, and after a while it will be taken out, put into a furnace, boiled and balled ready for the squeezers. The big wheel on the left is to turn the vat over, so that the iron may be poured out when ready to boil. What you see in the vat now is cinder that has been put in this afternoon and is burning. It is to glaze over the surface of the vat. The experiment of puddling will be made hereafter."

The reporter asked Mr. Brown what would be the result if the new invention was a success.

"The result would be," he said, "that in a few months there would not be a puddling furnace in the United States. It will revolutionize the puddling of iron, and this method will be used."

Dr. Chapin, who was standing near, felt sanguine of success, saying that the experiment might prove a failure at first, but it could be ascribed to the air pump, which probably lacked the requisite power.

Japanese Telegraphs.—The Japanese government is evidently losing no time in extending its system of telegraphic communication, for there are now 125 telegraph stations in the country, and it is estimated that there are 5000 miles of wire in operation; 1000 miles more are in course of construction, and still further extensions are contemplated. Considering that the first telegraph line for practical purposes was not erected in Japan before the end of 1869, the result achieved is by no means unsatisfactory.



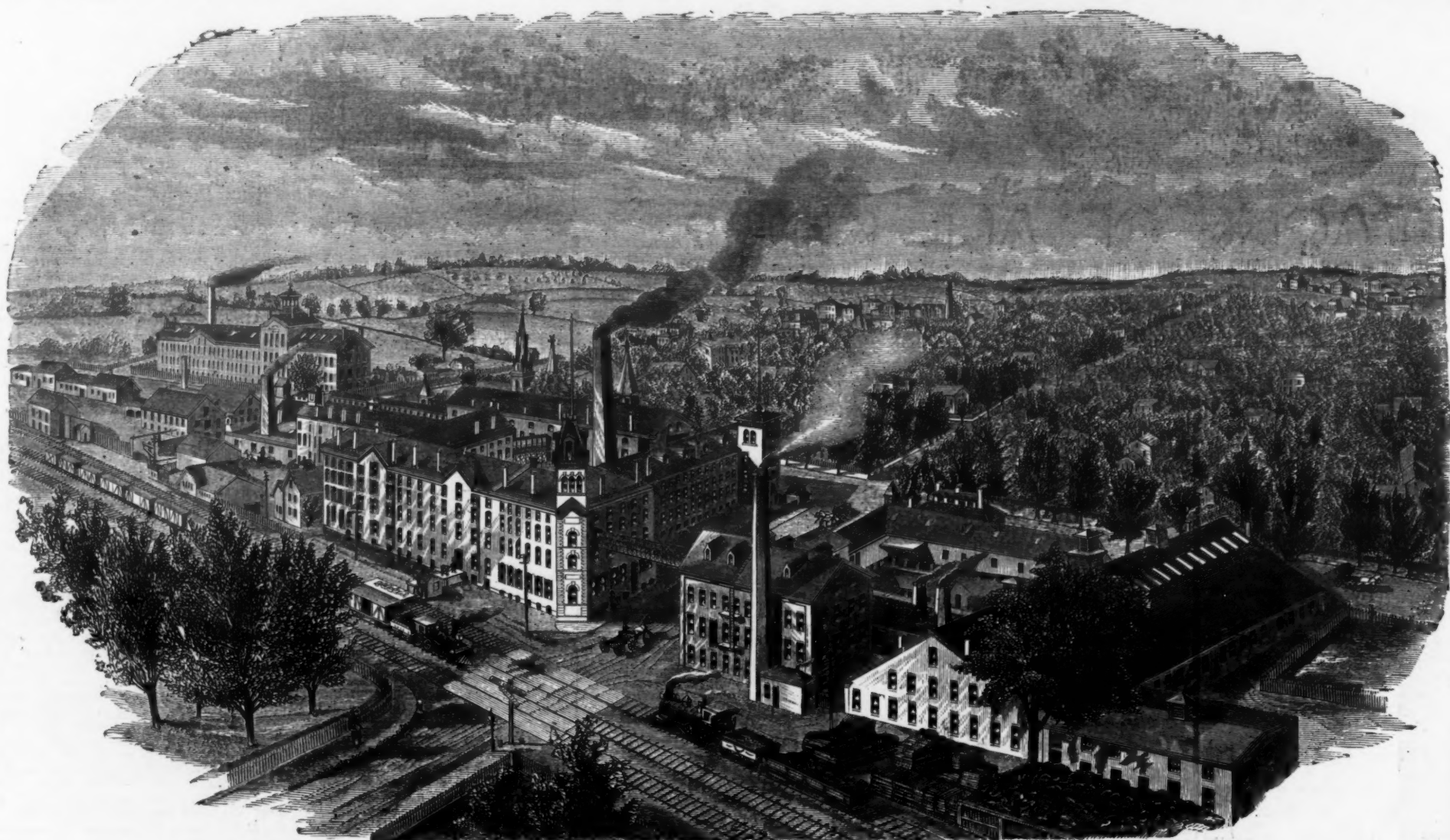
# RUSSELL & ERWIN MANUFACTURING COMPANY

**Manufacturers of HARDWARE.**

**FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.**

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE, Agent, 17 South Charles Street.



*Screw Factory.*

*Offices, Packing Room and Main Factory.*

*Finishing Shop.*

*Iron Foundry.*

WORKS OF

THE RUSSELL & ERWIN MANUFACTURING COMPANY,

NEW BRITAIN, CONNECTICUT, U. S. A.

**RIM AND MORTISE DOOR LOCKS, KNOBS, &c.**

Particular attention is called to our new lines of Rim and Mortise Locks, with our

**PATENT ALL STEEL NICKEL-PLATED KEYS.**

**WOOD SCREWS, - - - Complete Assortment.**

POLISHED FIRE IRONS, Iron and Brass Head Shovels and Tongs.

HALE'S MEAT CUTTERS, Bake Pans, &c., &c.

**PADLOCKS.**

**CABINET LOCKS.**

Sole Agents for the

**DOUGLASS MFG. CO., JAMES SWAN, Successor,**

Best Cast Steel CHISELS, DRAWING KNIVES, AUGERS, BITS, Cook's Patent AUGERS, BITS, &c., &c.

We also offer a full line of

**GENERAL HARDWARE**

at lowest market rates.



## Cutlery.

## FRIEDMANN &amp; LAUTERJUNG,

Manufacturers of PEN AND POCKET CUTLERY.

Solid Steel Scissors, Shears, Razors,  
Russia Leather Straps, Hones, &c.

Sole proprietors of the renowned full concave patent

"ELECTRIC RAZORS,"

And the celebrated "ELECTRIC SHEARS." Nickel Plated  
Blades.

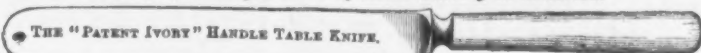
Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &amp;c.

91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

## MERIDEN CUTLERY CO.

The Oldest Manufacturers of Table Cutlery in America.



EXCLUSIVE MAKERS OF THE

## CELLULOID

HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers  
of all kinds of TABLE, BUTCHER AND HUNTING KNIVES.  
Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.

THE  
**LAMSON & GOODNOW**  
88  
CHAMBERS ST.  
MFG. CO.  
N.Y.  
GARDNER'S PATENT  
AMERICAN TABLE  
CUTLERY & C.

## NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN &amp; POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

## STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved  
Carpenters'  
Tools.

FACTORIES,

New Britain, Conn.

WAREHOUSES,

29 Chambers St.,  
New York.

## HALL, ELTON &amp; CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



Factories, Wallingford, Conn.

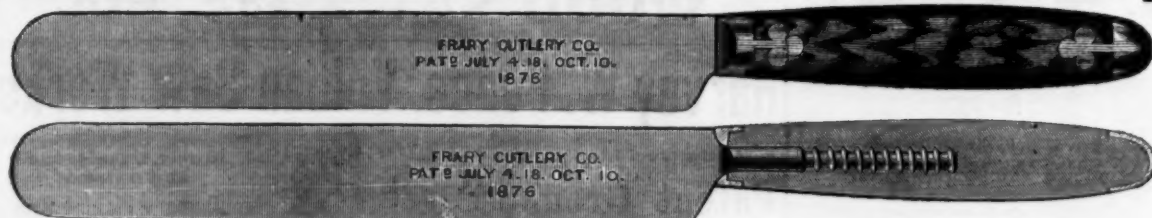
Salesroom, 75 Chambers Street, New York.

## THE FRARY CUTLERY COMPANY,

FACTORY, BRIDGEPORT, CONN.

NEW YORK OFFICE &amp; WAREHOUSE, with WIEBUSCH &amp; HILGER HARDWARE CO., 84 Chambers St.

## Manufacturers of all kinds of Table Cutlery.



The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butcher and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

## CLOTHES WRINGER!

T. J. ALEXANDER, Manager,  
BOSTON, MASS.

## Bemis &amp; Call Hardware &amp; Tool Co.



These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS &amp; CALL HARDWARE &amp; TOOL CO., Springfield Mass.

## Cutlery.

## McCOY &amp; CO.,

SUCCESSORS TO

Van Wart &amp; McCoy.

Importers & Commission  
Merchants.

Hardware, Cutlery, Sad-

dlery, Metals, &amp;c.

134 and 136 Duane St., New York.

## Cutlery.

## JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm &amp; Son,

"Limited."

Washington Works, SHEFFIELD,  
Celebrated F-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER &amp; CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

CORPORATE MARK.

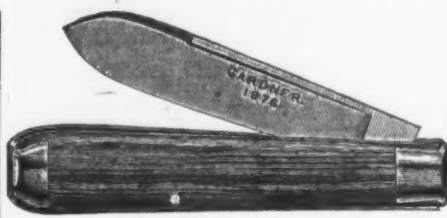
) NO SPENCER  
ROTHERHAM

Granted 1777.

## HERMANN BOKER &amp; CO.,

101 &amp; 103 Duane Street, New York,

SOLE AGENTS FOR THE

GARDNER PATENT  
POCKET KNIVES

All of Gardner's Patent Knives are fully warranted.

ESTABLISHED 1853.



AARON BURKINSHAW,

Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass.  
My Blades are forged by hand from the best Cast Steel, and warrant-  
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

## RUSSELLS

PARALLEL  
TOOLS.

## PATENT

## HAGSTOZ &amp; THORPE.

Sole Manufacturers and Proprietors.

10th and Chestnut Sts., Philadelphia, Pa.

## CORPORATE MARK.



## Joseph Rodgers &amp; Sons'

(LIMITED)

## CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. &amp; W. CLATWORTHY, Agents.

The demand for Joseph Rodgers &amp; Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers &amp; Sons' Manufacture, please to see that they bear their Corporate Mark.

ESTABLISHED 1852.

## NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

## Table &amp; Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST  
MATERIAL.

## WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

## ALFRED H. HILDICK,

12 Warren St., N. Y., Importer of

Birmingham Heavy Hardware, Chains,  
Anvils, Vises, &c.

Agency of HILL BROS. &amp; CO., WALSALL, ENGLAND

GENERAL HARDWARE MERCHANTS,  
And of

## Ball's Pat. Solid Steel Sheep Shears.



These Shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of neck and blade. Samples can be seen at above address, or sample lots furnished. Depot for "THE CHOWN" SOLID BOX VISES. A cheap and excellent Vise.

## TACKLE BLOCKS.

Rope and Iron Strap of all kinds. Lig-  
numvitae Wood for Ten-Pin Balls.

Wm. H. McMillan &amp; Bro.,

Office, 113 South Street, New York.

Factory, 39 to 40 Penn St., Brooklyn, E. D.

## American Sheet Iron and Tin Plates.

The United States Iron and Tin Plate Company of Pittsburgh, Pa., have issued the following under date of July 1, 1878:

GENTLEMEN: Herewith we have the pleasure to inform you that we have concluded an agreement with Messrs. Ely &amp; Williams of Philadelphia and New York, by which they have become our sales agents for the Eastern States.

Having succeeded by constant attention and care in making superior grades of sheet iron, we venture to say our products compare favorably in quality, as well as in price, with any other, foreign or home made. We shall continue to devote our special attention to the details of manufacturing, and having established at least one new industry in which foreigners have held a monopoly for a long time, we desire to form a closer connection with consumers, and believe you will agree with us that the medium we have chosen in the selection of our agents is a proper one. The services which Messrs. Ely &amp; Williams have rendered by introducing home-made articles of other branches in the iron and steel industry are well known and appreciated by the trade; and it is known as well that they do not undertake to offer their customers any articles the quality of which they cannot guarantee to be as represented.

The products of our works are the U. S. A. M. and J. H. Stamping iron, show card iron, Taggers iron, shovel iron, stove-pipe iron, and the U. S. terne plates, all furnished to order in sizes to suit the wants of the consumer.

For the convenience of our customers we have divided our stamping iron into the following standard grades: U. S. A. M., No. 1, 1½, 2, 2½ and 3; and J. H., No. 1. The latter is a very fine product of the Bessemer furnace and is suitable for many purposes. By letting us know the purpose for which the iron is wanted we can in most cases tell which of our grades will answer best, or we will even make special grades to suit the purpose.

Our No. 1 stamping iron has stood as severe tests as were ever brought to iron, and all our other grades have in almost every instance given full satisfaction to the trade.

Our show card iron has gained quite a reputation on account of its fine, smooth surface, and the greatest portion of iron show cards are now made from our iron.

The manufacture of taggers iron has so far been only a minor item in our business, but having succeeded in producing a really excellent article, we shall in future pay full attention to this branch of the iron industry.

Shovel manufacturers will find it greatly to their advantage to correspond with us or our agents, as we are satisfied we can suit them in all grades of iron plates, as well as Bessemer steel plates.

We furnish stove-pipe iron in joint length for pipes of any width from 5 to 8 inches diameter; and we would call particular attention to our bright stove-pipe iron which has of late come into use, and which serves those who wish to have nice, bright stove pipes without paying the high price of Russia iron.

We are arranged to finish all our iron in the following different styles, viz.: Pickled and cold rolled, pickled, cleaned, cold rolled or with common surface. And we furnish to order the following sizes of all our grades: No. 6 to 12, Birmingham gauge, from 10 x 14 to 24 x 36; No. 13 to 27 gauge, 10 x 14 to 24 x 72; and of our different charcoal grades, No. 23 to 34 gauge, from 10 x 14 to 20 x 40; and No. 35 to 40 gauge, from 10 x 14 to 14 x 20. The Birmingham wire gauge being as yet the standard with iron manufacturers, our price list is based on it; but we would request you to give, whenever it is possible, either the weight per square foot or the thickness of the plates in thousands of an inch.

In regard to the manufacture of terne plates, we have to state that although we have established a first-class reputation for the United States plates, we have been compelled to give up the manufacture of them as a staple article for the present, because the prices of the imported plates have fallen so low that we cannot get the cost price for ours. One reason for this fact is the comparatively very low import duty; for although the manufacture of tin and terne plates is one of the most important but difficult branches of the iron industry, the duty on the foreign article is only about one-half of that on any other article of which the main substance is iron. The attention of our present Congress has been repeatedly called to this fact, but with no avail; and now we shall have to wait until our legislators see fit to assist the development of an industry which, if protected the same as other products of iron and steel, would in a short time provide a livelihood for many thousands of American citizens, and by which \$16,000,000 would be kept circulating at home instead of going annually to foreign countries. However, we shall be very glad to receive orders for terne plates in regular or odd sizes whenever consumers deem it to their interest to pay our price.

Our agents are prepared to give you full information in regard to qualities and prices of our goods, and we hope you will favor us with a liberal patronage. Yours respectfully,  
U. S. IRON AND TIN PLATE CO.

It so happens that the two great bridges in progress, one across the East River and the other across the Hudson at Poughkeepsie, are seriously embarrassed by the lack of funds. On the latter very little is doing, and in regard to the first Commissioner Prentice remarked yesterday to the representative of The Iron Age that unless New York city provided her proportion of the funds, to stop would be the only alternative. As yet work in the engineers' department gives employment to the full number of hands.

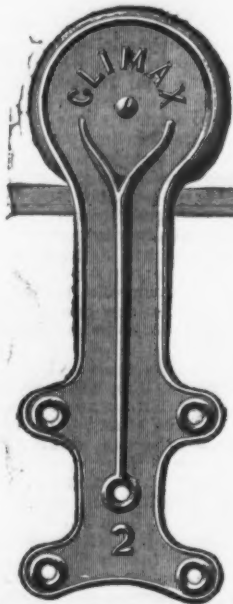
President Foster, of the Metropolitan Elevated Railway, says they are laying foundations on Ninth avenue between Fifty-ninth and Eighty-first streets jointly with the New York Elevated Railway Company, and excavations are in progress from Sixth to Ninth avenues in Fifty-third street to form the connecting link. The work is pushed as fast as possible.



# S. H. & E. Y. MOORE,

68 Lake Street, CHICAGO, ILL.,  
Heavy Hardware & Railway Supplies.

AGENTS FOR  
Providence Tool Co., Reading Bolt & Nut Works, Syracuse Bolt Co.,  
And Other Manufacturers.



## CLIMAX BARN DOOR HANGERS, MOORE'S Anti-Friction Sliding Door Sheaves, "Folant" Barn Door Catches, &c., &c.

The "Climax" is recognized as the **Leading Hanger** in the market. It is **altogether superior** to any other Barn Door Hanger ever made. In the "Climax" is a **complete wheel** provided with Anti-Friction Bearings. It is practical, hence its widespread popularity. It is the **only Anti-Friction Hanger having a Wheel**. The trade are cautioned against imitations, made to sell, and which are without any mechanical principles to recommend them.

### Moore's Anti-Friction Hay Fork Pulley.

The main wheel contains four anti-friction wheels which revolve upon axles fast in its sides. The main wheel revolves nine times while the anti-friction wheels are revolving once.

Depot for goods of our manufacture:

FERNALD & SISE, 100 Chambers Street, New York.  
E. & C. GURNEY & CO., Hamilton, Canada.

## TENNIS & WILSON,

Successors to J. CLARK WILSON & CO.,  
No. 81 Beekman Street, NEW YORK.

SOLE AGENTS FOR

SNELL MFG. CO., Augers, Bits & Boring Machines,  
DAVIS LEVEL & TOOL CO.,

Plumbs, Levels, Inclometers, &c.

WILSON MFG. CO., Vises and Coffee Mills, &c.  
CLARK & CO.,

Blind Hinges, Cast Butts and Axle Pulleys.

TAYLOR MFG. CO., Door Bells & Weeds Gates, &c.  
OAK HILL MFG. CO., Hangers, G. S. Fixtures, &c.

FISHER & NORRIS, Eagle Anvils and Chain Vises.

W. HUNT & CO., Razor Straps.

NEWCOMB BROS., Blacksmiths' Bellows.

We have a Stock of

Moore's Climax Barn Door Hangers, No. 2,  
which we offer at 65 per cent. discount.

## HAYDEN & SMITH,

Auburn, N. Y.,

Manufacturers of

Carriage and Saddlery Hardware,

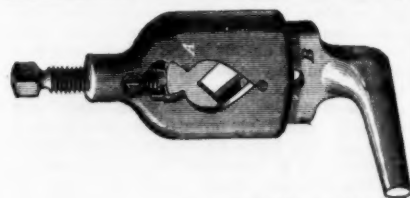
Owners of

LAMB'S PATENT

Seat Fasteners.



The Safest and only reliable Seat Fastener for Wagons.



### NORTH'S PATENT Universal Lathe Dog.

It is very strong. Holds very strong. Will not deface finished work. Holds round, square or irregular work. Always stands up square with the work and will not "skew." Is more evenly balanced than the common dog.

Send for circular.  
SELDEN G. NORTH, No. 347 North 4th Street, Philadelphia, Pa.

## THE STANLEY WORKS, Wrought Iron Butts, Hinges AND DOOR BOLTS,

MANUFACTURERS OF

Plain, Japanned, Bronzed and Plated.

We have recently purchased CROOKE & CO.'S entire stock of WROUGHT BRIGHT BUTTS, orders for which are solicited.

FACTORIES: NEW BRITAIN, CONNECTICUT. WAREHOUSE: 79 Chambers St., New York.



### DOG MUZZLES.

The Patent Automatic, with Spring Jaw.  
COMMON WIRE MUZZLES,  
New Pattern, in nine different sizes. Also full and varied line of Metal and Leather

### DOG COLLARS.

Stair Rods in Brass, Fire Gilt and Nickel-Plated.  
Tacks, Escutcheon Pins, Hair Wire, Picture Wire, &c.  
Special Brass Goods made to order.

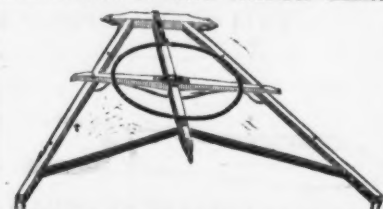
W. T. & J. MERSEREAU, 321 Broadway, N. Y.



## R. COOK & SONS, Manufacturers of Carriage & Wagon AXLES,

WINSTED, CONN.  
ESTABLISHED 1839.

## EUREKA PLATFORM SPRING WAGON GEAR.



Patented in the United States and Canada.  
The attention of Manufacturers and of the Carriage Hardware Trade is respectfully invited to the Eureka Platform Spring Wagon Gear.  
This Gearing is far ahead of all others in strength and light appearance. It is the strongest and most perfect gear in use, and is meeting with a large sale. Manufacturers of Platform Wagons will use no other after a trial of this.

PRICE.  
\$7.00 for Trestle warranted to carry 1000 lbs.  
" 7.50 " " " 1500 " "  
" 8.00 " " " 2000 " "  
Terms cash. Liberal discount to the trade.  
For circulars and full information address  
ROME TRESTLE COMPANY, Limited,  
ROME, N. Y.

### STEAM ENGINES,

A. B. FARQUHAR, York, Pa.

Cheapest and best for all purposes—simple, strong, and durable. Also Traction Engines for common roads.

SAW, GRIST AND RICE MILLS, GRAYS, PRESSES AND MACHINERY generally. Inquiries promptly answered.

Vertical Engines, with or without wheels, very convenient, economical and complete in every detail, best and cheapest Vertical in the world. Fig. 1 is engine in use. Fig. 2 ready for road.

The Farquhar Separator

(Warranted) For Agricultural Works, York, Pa. Light draft, most durable, simplest, most economical and perfect in use. Warranted to clean all kinds of grain. Write, please, for circular.

Send for Illustrated Catalogue. Address A. B. Farquhar, York, Pa.

Send for Catalogue.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

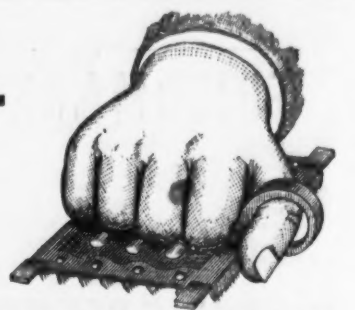
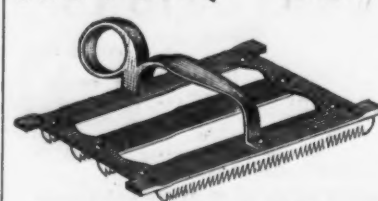
Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

Send for Illustrated Catalogue.

Address A. B. Farquhar, York, Pa.

## HOTCHKISS' Novelty Combs.



We ask the attention of the public to our Patent Novelty Curry Combs, represented above, which are universally acknowledged to be far superior to anything in the market, being neat and durable and the most convenient to handle of any comb yet produced. They are put up in paper boxes of one dozen each, and packed 24 dozen in a case. GIVE THEM A TRIAL. For Sale by the jobbing Hardware, Saddlery and Woodenware trade.

HOTCHKISS' SONS, Bridgeport, Conn.

## Philadelphia "STAR" Bolt Works.

NORWAY IRON FANCY HEAD BOLTS,  
Carriage & Tire Bolts. Star Axle Clips, &c.  
TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.

BLACK AND TINNED IRON RIVETS.  
5 oz. 1 lb. 1 1/2 lb. 2 lb. 4 lb. 6 lb. 7 lb. 8 lb.



W. P. TOWNSEND & CO.,  
PITTSBURGH, PA.,  
Manufacturers of every description of First Quality,  
RIVETS.

## FORT PLAIN SPRING AND AXLE WORKS.

FOR SPRING TRADE.  
All dealers in SPRINGS AND AXLES will find it to their interest to send to us for Price List and Discounts.  
WOOD, SMITH & CO., Fort Plain, N. Y.

## Wheeler, Madden & Clemson MFG. CO., MIDDLETOWN, . . . NEW YORK.

Manufacturers of  
WARRANTED CAST STEEL  
SAWS

Of every description, including  
Circular, Shingle, Cross-Cut, Mill, Hand,  
WOOD SAWS, Etc., Etc.

## Harvey W. Peace, Vulcan Saw Works.

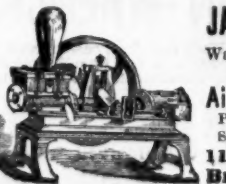
Manufacturer of every kind of  
Patent Ground SAWS.  
Circulars, Cross-Cuts, Mill  
Mules, Gang, Hand,  
and Butcher.  
Molding and Planing Knives,  
Plastering Trowels, Miter-  
ing Rods, &c.  
Union Avenue, Tenth and Ainslie Streets, BROOKLYN, E. D., N. Y.

## AMERICAN SAW CO.,

Manufacturers of  
Movable Toothed Circular Saws,  
PERFORATED CROSS-CUT SAWS  
And SOLID SAWS of all kinds.  
Trenton, N. J.

## OLD COLONY RIVET WORKS,

KINGSTON, MASS.,  
MANUFACTURERS OF  
Rivets, Hand Iron Cutters, Punches, Shears, and Planing and Shaping Machines  
Universal Ratchet Drills, and Patent Tinner's Snips.  
New York Warehouse, 116 Chambers Street.



### JAS. CLAYTON.

Water, Air & Vacuum

PUMPS

Air Compressors.

Prices greatly reduced.

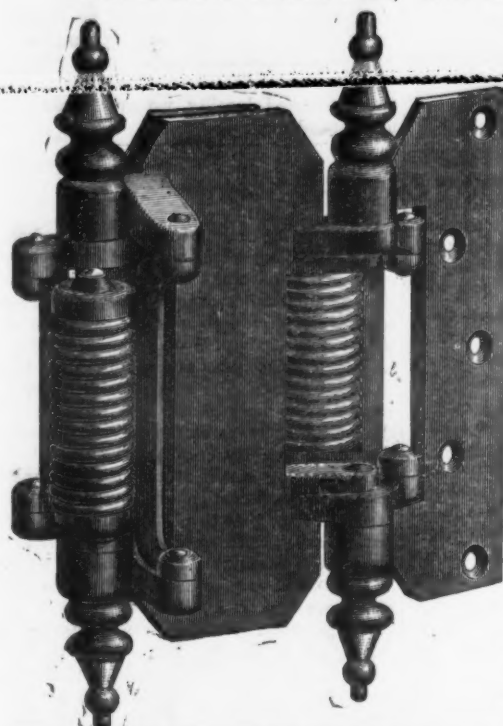
Send for circulars.

11 & 16 Water St.,

Brooklyn, N. Y.



## Spring Butts for Screen Doors, ON A NEW PRINCIPLE, THE MOST DESIRABLE.



**POINTS OF SUPERIORITY:**  
They exert their greatest force at the closing point.  
They will not allow the door to sag.  
They will retain the door against the wall when opened back of a right angle.

Single acting, for swinging doors one way, doors 7/8 or 1 in. thick, per pair.....\$1.25  
Double acting, for swinging doors both ways, per pair.....2.00  
Liberal discount to the trade.  
Send for circulars and prices.

MANUFACTURED SOLELY BY THE  
**Cowles Hardware Company,**  
Unionville, Conn., U. S. A.

We can also furnish all sizes of larger Butts, working on same principle.

**AGENTS:**  
COULTER, FLAGLER & CO.,  
87 Chambers St., New York.  
SAM'L G. B. COOK & CO.,  
Baltimore, Maryland.

## LEWIS, OLIVER & PHILLIPS, PITTSBURGH, PA.,

MANUFACTURERS OF

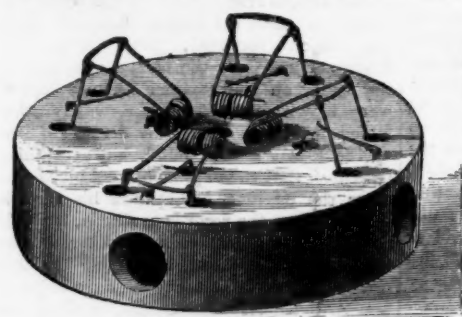
## Heavy and Wagon Hardware, BOLTS AND NUTS

OF ALL KINDS,



**Screw Hook and Strap and T Hinges,  
Etc. Etc.**

Send for lithographs and price lists.



"Common Sense"

**MOUSE TRAPS,**  
For Home and Export Trade.

**BEST IN MARKET.**

**RIPLEY MFG. CO.**

Unionville, Ct., U. S. A.,

Manufacturers of  
House Furnishing Hardware.

## Fancy Brass Goods and Small Iron Castings TO ORDER.

**THE TURNER & SEYMOUR MFG. CO.,**

Manufacturers of Upholsterers' Goods, Shade Fixtures, Notions,  
House Furnishing and Fancy Hardware.

FACTORY, Wolcottville, Conn. STORE, 81 Reade and 97 Chambers St., New York



[The "Family" Egg Beater.



**EUREKA  
Fruit Picker.**

The Best Article of the  
Kind ever Invented.

General Agents for **HAYDEN & CO.,** Middletown, Conn.  
Manufacturers of **Blind Trimmings,**  
Van Sand's old style, No. 3705.



**THE PEERLESS PORTABLE ENGINE,  
From 6 to 12 Horse-Power, and  
DOMESTIC Semi-Portable Steam  
Engine,**  
From 2 to 4 Horse-Power.

The only Engines in the Market, attached to the Boiler, having  
**COLD BEARINGS.**

All parts interchangeable. Hardened connecting pins. Placed upon strong springs to produce easy carriage. Nothing cheap but the price. Send for Illustrated Catalogue and Price List to

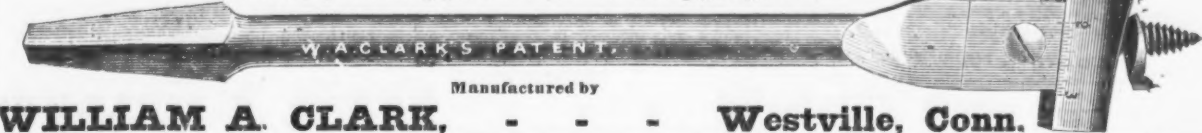
**F. F. & A. B. LANDIS, Cherry St., Lancaster, Pa.**

## HOLROYD & CO., Waterford, N. Y.

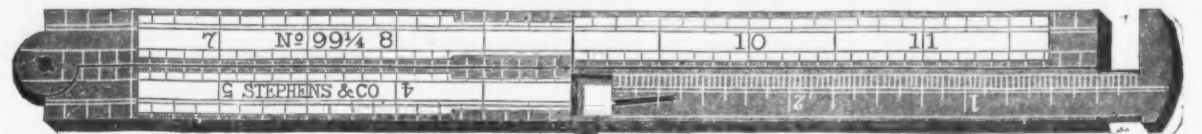


### CLARK'S PATENT EXPANSIVE BITS

Made of **JESSOP'S BEST CAST STEEL**, and warranted superior to any other  
Two sizes: Large Size Boring, 7/8 to 3 inches; Small Size Boring, 1/2 to 1 1/4 inches.



Manufactured by  
**WILLIAM A. CLARK, - - - Westville, Conn.**



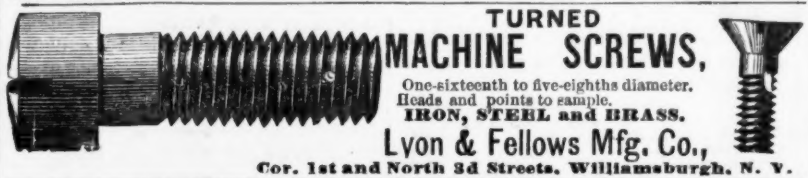
Established in 1854. Manufacturers of **U. S. Standard BOXWOOD and IVORY RULES.**  
Also Exclusive Manufacturers of **L. C. STEPHENS' PATENT COMBINATION RULE.**  
Rules graduated in foreign measure to order. **H. DURRIE & CO., New York Agents, who will supply the trade at factory prices.**

### The only GENUINE D. R. BARTON Tools ARE MADE BY

**THE D. R. BARTON TOOL CO.,**

Cor. Mill and Furnace Streets, ROCHESTER, N. Y.

**AGENCIES:**  
**HEATON & DENCKLA,** - - - 507 Commerce Street, Philadelphia, Pa.  
**H. O. STRATTON,** - - - 33 Oliver Street, Boston, Mass.  
**HUNTINGTON, HOPKINS & CO.,** - - - Sacramento.  
**NATHAN WEED,** - - - 4 Gold Street, New York.



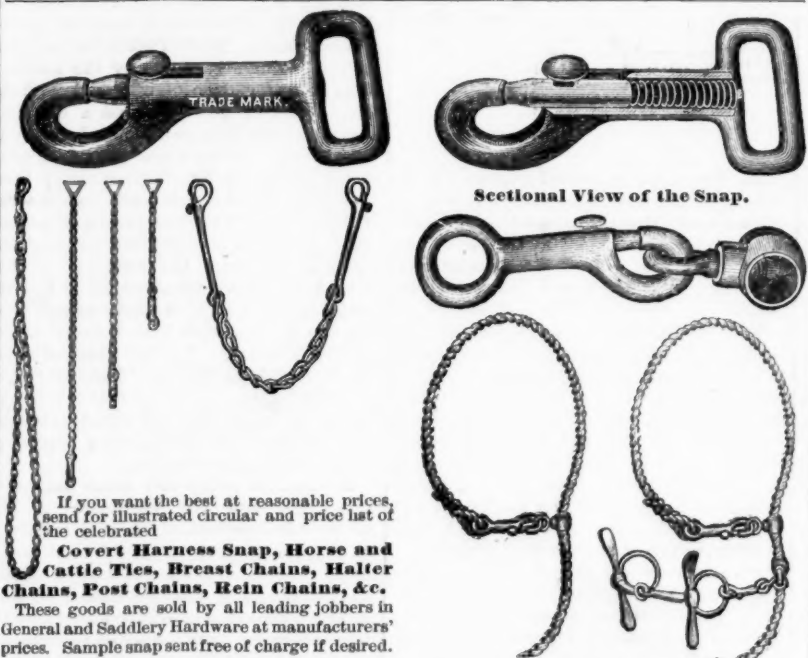
**TURNED  
MACHINE SCREWS,**  
One-sixteenth to five-eighths diameter.  
Heads and points to sample.  
**IRON, STEEL and BRASS.**  
**Lyon & Fellows Mfg. Co.,**  
Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

### THE AETNA SPRING AND AXLE CO.,

John St., Bridgeport Conn., Manufacturers of

**THE VERY BEST SPRINGS AND AXLES.**

Our Standard Springs, weighing about half as much as the Springs of other makers, to do the same work cost but little more per vehicle than a common Spring. Our Jamb-screw, Collingie Collar, Parallel Arm, Malleable Iron Box Axles are the best in the world. Exclusive makers of  
**LEWIS'S TORSION AND CROSS SPRINGS.**  
Supercedes the Brewster Cross and End, dispenses with side spars, weigh less, hangbody equally low, ride easier and cost less. Shop newly stocked with new and improved Machinery. Send for Price Lists  
**W. H. WILSON** Pres. and Treas. **O. P. LEWIS** (formerly of Spring Perch Co.) Sec. and Supt.



If you want the best at reasonable prices, send for illustrated circular and price list of the celebrated

**Covert Harness Snap, Horse and Cattle Ties, Breast Chains, Halter Chains, Post Chains, Rein Chains, &c.**  
These goods are sold by all leading jobbers in General and Saddlery Hardware at manufacturers' prices. Sample snap sent free of charge if desired.

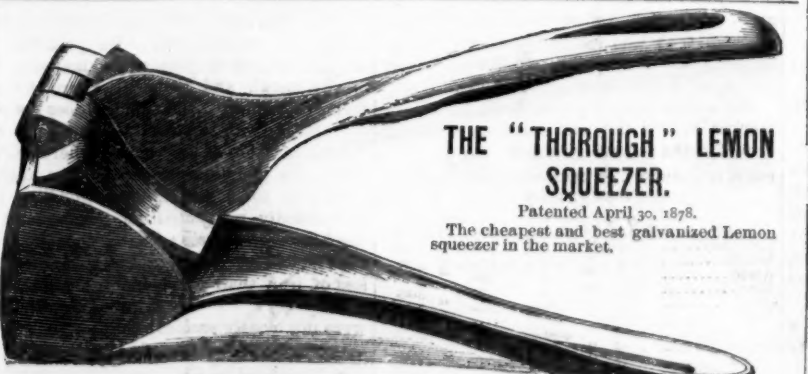
Address  
**COVERT MFG. CO.,** Sole Manufacturers, Troy, N. Y.

**E. & J. C. COVERT, Sole Manufacturers,**  
Factory and Salesroom, FARMER VILLAGE, N. Y.



**BUY THE  
Covert Neck Yoke AND  
NECK YOKE  
LEATHERS.**

Our sales for the first half of 1878 have exceeded any one whole year heretofore. What better recommendation can we produce to show that we are manufacturing a **Superior Article.**  
**Satisfaction always guaranteed.** Sample Leather sent by mail on receipt of 60 cents. For full particulars send for circular and catalogue. For sale by jobbers in carriage goods at manufacturers' prices.

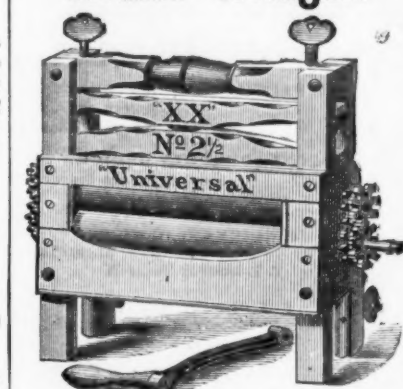


**THE "THOROUGH" LEMON  
SQUEEZER.**

Patented April 30, 1878.  
The cheapest and best galvanized Lemon squeezer in the market.

Manufactured and for sale by **W. & J. TIEBOUT,**  
Manufacturers of **BRASS GALVANIZED & SHIP CHANDLERY HARDWARE,** - 290 Pearl St., New York.

### THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double Cog-Wheels on both ends of each roll.

**Over 500,000 sold!**  
And now in use, giving "Universal" satisfaction.

**MANUFACTURERS' PRICES.**  
Per doz.  
No. 2 1/2, Usual Family size, Rolls 10x1 1/2.....\$60.00  
No. 2, Med. " " " 10x1 1/2.....63.00  
No. 1 1/2, Large " " " 11x1 1/2.....71.00  
No. 1, Large Laundry size, Rolls 12x2.....93.00  
No. 3, Large Hotel size, Rolls 14x2 1/2.....144.00

**EVERY WRINGER WARRANTED.**

Be sure and inquire for the "Universal."

Sold by dealers everywhere.

**Metropolitan Washing Machine Co.**

32 Cortlandt St., New York.

### RIEHLE BROS.' STANDARD SCALES AND TESTING MACHINES



New Style  
Warehouse  
Scales.  
Iron Tops.

### The "Monroe" Patent Combined GLOSSING AND FLUTING IRON.

With Brass or Nickel Flutes. Prices furnished upon application.



**BURGER & BAUMCARD, Sole Agents,**  
88 Duane St., New York.



# The Iron Age.

New York, Thursday, July 18, 1878.

DAVID WILLIAMS . . . Publisher and Proprietor.  
JAMES C. FAYLES . . . Editor.  
JOHN S. KING . . . Business Manager.

## RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

IN THE UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

Weekly Edition . . . \$4.50 a year.  
Issued every THURSDAY morning.  
Semi-Monthly Edition . . . \$2.30 a year.  
Issued the FIRST and THIRD THURSDAY of every month.  
Monthly Edition . . . \$1.15 a year.  
Issued the FIRST THURSDAY of every month.  
Remittances may be made at our risk by post office money order, draft on a New York or Philadelphia bank, or in a registered letter.

### TO OTHER COUNTRIES.

	Weekly	Semi-Monthly	Monthly
Mexico . . . . .	\$5.00	\$2.50	\$1.25
West Indies (all the Antilles) . . . . .	5.00	2.50	1.25
South America (except Venezuela) . . . . .	5.00	2.50	1.25
Venezuela . . . . .	5.00	2.50	1.25
Central America . . . . .	5.00	2.50	1.25
Europe . . . . .	5.00	2.50	1.25
Australasia . . . . .	5.00	2.50	1.25
Asia—India and East Indies . . . . .	5.00	2.50	1.25
Japan . . . . .	5.00	2.50	1.25
China . . . . .	5.00	2.50	1.25
Other Countries . . . . .	5.00	2.50	1.25

### EUROPEAN AGENCY.

We have established an office at B 3, American Section, Exposition Universelle, Paris, where advertisements and subscriptions are received and other business connected with our publications transacted.

### ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50  
one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$40.00; payable in advance.

DAVID WILLIAMS, Publisher,  
83 Rende Street, New York.

PITTSBURGH OFFICE.

77 FORTH AVENUE.

JOS. D. WEEKS, Manager and Associate Editor.

PHILADELPHIA OFFICE.

230 SOUTH FOURTH STREET.

THOS. HOBSON, Manager.

CINCINNATI OFFICE.

MERCHANTS' EXCHANGE.

T. T. MOORE, Manager.

SOUTHERN OFFICE.

EIGHTH AND MARKET STS., CHATTANOOGA, TENN.

S. R. LOWE, Manager.

### BRITISH AGENCY.

The publishers of *The Iron Age*, 44 Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

### AUSTRALIAN AGENCY.

The American Hardware Company, Melbourne, are our agents for Australia. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

## CONTENTS.

**First Page.**—Chanvin and Marin-Darbel's Testing Machines. Benjamin Haywood. Luck in Mining. Illinois Coal. Silveroid.  
**Third Page.**—The Currency of China.  
**Fifth Page.**—The Currency of China. (Continued). The Telephone on a Railroad. Flame Temperature. The Recent Boiler Explosion at Cambridge.  
**Seventh Page.**—A Consular Report from Denmark.  
**Ninth Page.**—The Boiler Explosion at the Chesapeake Nail Works. Puddling by a New Process. Japanese Telegraphs.  
**Eleventh Page.**—American Sheet Iron and Tin Plates.  
**Thirteenth Page.**—Condition of the Blast Furnaces of the United States July 1, 1878. Lead. Lime for Purifying Iron. Explosions of Carbon Dust. Boiler Explosions from Sudden Relief of Pressure. Opening of the Sutro Tunnel.  
**Fifteenth Page.**—Failures for the First Half of 1878. Condition of the Blast Furnaces of the United States July 1, 1878.  
**Seventeenth Page.**—Coke Manufacture in Pennsylvania. American Stoves at the Paris Exhibition.  
**Nineteenth Page.**—The Paris Exposition.  
**Twenty-first Page.**—The Paris Exposition. (Continued).  
**Twenty-third Page.**—Trade Report. General Hardware. Iron. Metals.  
**Twenty-fifth Page.**—Metals. (Continued). Old Metals. Paper Stock, etc. Exports. Imports. Coal. Philadelphia. Pittsburgh.  
**Twenty-seventh Page.**—Chattanooga. Cincinnati. Boston. St. Louis. Baltimore. Louisville. Richmond. Foreign. Our English Letter.  
**Twenty-ninth Page.**—Our English Letter. (Continued). Industrial Items. French Views of American Competition with Great Britain. Nail-makers' Strike in England.  
**Thirtieth Page.**—The Iron Age Directory.  
**Thirty-first Page.**—New York Wholesale Prices.  
**Thirty-second Page.**—New York Wholesale Prices. (Continued).  
**Thirty-third Page.**—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.  
**Thirty-fourth Page.**—Boston and St. Louis Hardware and Metal Prices.

The British steamer *Othello*, of Wilson's line to Hull, which sailed this week, had on board 166 packs, comprising 140 tons of locomotive machinery from the Baldwin Locomotive Works. The machinery is in the nature of duplicate parts to complete engines previously ordered for three Russian railways, viz., Oral, Woronesca and Chasone lines. The company are already at work on ten engines ordered for the New York Elevated Railway Company, as mentioned in these columns last week.

## Condition of the Blast Furnaces of the United States, July 1, 1878.

We print in another column our regular quarterly report of the condition of the blast furnaces of the United States. The statistical data there given as to the number of furnaces in and out of blast, and their estimated capacity, have been obtained through the kindness of numerous correspondents in all parts of the country. The full local knowledge of gentlemen who closely observe the fortunes of the iron industries of a small section, insures accuracy, so that with more than five years' experience in collecting and compiling these data, we are in a position to present them to our readers with the assurance that they are approximately correct. In order to avoid any misunderstanding and to point out exactly the scope of the table, the following explanations are given:

1. The divisions of localities are geographical for the most part, and are not made with reference to the points from which furnace supplies are drawn. 2. The columns "in blast" and "out of blast" only show the stacks from which we have reports, and their footings will not equal the footings of the column of total number. 3. We have included some furnaces that are rebuilding and not yet completed and others that are building, and in one or two cases some furnaces that have been reported abandoned, since their owners do not report them. In other cases we have stricken from our list furnaces that are generally included in such lists, as we are assured that they are permanently out. 4. The column of capacity per week is much in excess of what the regular working of the furnace will show—stoppages, slow working and various other causes which will readily occur to those interested, combining to reduce the make below the furnace capacity.

The condition of the furnaces at the date of our report is shown in a consolidated form in the following table:

	In Blast, July 1st.	Out of Blast, July 1st.
Charcoal . . . . .	64	202
Anthracite . . . . .	95	130
Bituminous . . . . .	89	128
Total . . . . .	248	460

This shows a partial increase in the total number over the report of a year ago. At that time the statement was as follows:

	In Blast, July 1, 1877.	Out of Blast, July 1, 1877.
Charcoal . . . . .	87	181
Anthracite . . . . .	87	139
Bituminous . . . . .	85	123
Total . . . . .	259	443

Comparing these dates by percentages, which is the best test by reason of the changes in number from the building of new furnaces and the striking of others from the list as abandoned, and we have the following results:

PERCENTAGE OF FURNACES IN AND OUT OF BLAST				
JULY 1, 1877 AND 1878.				
	In Blast		Out of Blast	
	1877.	1878.	1877.	1878.
Charcoal.....	33	24	68	76
Anthracite.....	38	42	62	58
Bituminous.....	41	40	59	60

## Lead.

The almost uninterrupted decline in lead, both in Europe and this country, has been so extraordinary that the causes which brought it about merit a close investigation, the more so as they will be found to afford a basis for determining the future of the metal.

Since the pacification of the Spanish Peninsula the English and Spanish mine owners there have set to work energetically to develop the resources of their property after the many disappointments they experienced while the Carlist and "Intergente" rebellions lasted. Spain has thus been able to produce above an average yield during the past two years, and the English as well as the Marseilles markets have, until quite recently, been well stocked from that source. During the past two months the production has declined somewhat, in consequence of the ruinously low prices obtained. In England the production has been steady despite the continuous decline. In Germany as early as January it became apparent that the production would be unusually large this year, and as nothing has since happened that would lead us to infer the contrary, it is fair to presume there has been no abatement in production in that quarter. All we know is that a couple of months ago German producers were pressing sales "to arrive" in England and France. Since then the aspect has changed in Europe, the demand being on the increase once more, and coinciding with diminished receipts from Spain, prices have taken an upward turn. Larger purchases for Russian account have assisted the improving tendency, and the favorable result of the Congress at Berlin has created a general impression that lead, in common with other metals, is about to experience the benefits of a revival in all branches of business.

The course of lead prices in the New York market during the past eighteen months is shown in the following table:

PRICE, IN CURRENCY, OF COMMON DOMESTIC LEAD IN NEW YORK PER 100 LBS.				
	—1877—		—1878—	
January.....	\$6.15	to \$6.30	\$4.25	to \$4.40
February.....	6.30	" 6.40	3.87½	" 3.90
March.....	6.50	" 6.75	3.62½	" 3.80
April.....	6.40	" 6.45	3.80	" 3.62½
May.....	6.00	" 5.75	3.62½	" 3.25
June.....	5.50	" 5.70	3.20	" 3.12½
July.....	5.37½	" 5.25	.....	.....
August.....	5.00	" 4.90	.....	.....
September.....	4.75	" 4.62½	.....	.....
October.....	4.25	" 4.00	.....	.....
November.....	4.50	" 4.37½	.....	.....
December.....	4.50	" 4.37½	.....	.....

A sale seems to have been made in June

last as low as three cents, currency, per pound. The impression prevails that lead will not recede to the low figures of June unless the summer and early fall trade is a disappointment. Should production meanwhile increase to a considerable extent, even this summer demand, however good it might be, would not save lead from dropping back, temporarily at least, to June prices; but at this point the export demand always with the proviso that European prices are sustained at ruling rates.

The production of lead from argentiferous ore in Utah, Colorado and other localities in the extreme West has of late years assumed extensive proportions, much beyond the calculation of the metal trade. The mine owners mainly look to the silver, and readily sell the lead at what it will bring at the great distributing centers. Meanwhile the cost of production there, as well as in Missouri, has been considerably reduced in many ways, and prices such as ruled during the first four months of last year could not have been sustained in any event. A decline was therefore inevitable, but nobody expected that we should drop to the export figure so soon. Shipments have since been made both to China and Europe, and the Europeans were not a little alarmed when they perceived the arrival of American lead. Henceforward Europe will be important to us, not as a source of lead supply, but as a market for an occasional, or perhaps permanent, surplus. Much will of course depend on the general course of business. Peace in Europe is even more favorable to lead than war. When business prospers over there, and cities great and small undertake local improvements, a great stimulus is given to lead consumption. The same will be the case here when the building trade revives, and white lead will also command a larger sale.

The prospect of a general revival being promising both in Europe and here, we believe we are not too sanguine in predicting an increased consumption of lead in both hemispheres in the near future, large enough perhaps to make headway against the apparently irrepressible large output. Prices as high as those obtained 14 months ago may not be reached again in a generation; but, on the other hand, they are not likely to fall to three cents currency now that we have felt our way into the export trade.

## Lime for Purifying Iron.

In the discussion following the reading of a paper "On the Separation of Phosphorus from Pig Iron," by Mr. I. Lowthian Bell, at the March meeting of the British Iron and Steel Institute, Prof. Williamson suggested the replacement, by lime or some other cheap base, of a part of the oxide of iron used in Bell's process for eliminating phosphorus from pig iron. This suggestion was declared by Mr. G. Snelus to be of the greatest importance. He had taken out a patent for eliminating phosphorus by the substitution of lime for oxide of iron, and with the same object in view had lined a Bessemer converter with lime, the results being quite satisfactory. These views were in a measure sustained by Dr. Siemens, who, however, pointed out the difficulty encountered in the use of lime in consequence of the inability of so friable a material to resist the charges. Though the information thus elicited attracted some attention, it was not until a letter by R. F. Mushet was published that the process hinted at became one of general interest. In his communication Mr. Mushet declares that "Lime will now, thanks to Mr. Snelus, be found indispensable to the practical and economic success of the Bessemer process when applied to phosphoric pig or cast iron."

The interest which this letter excited in connection with the utterances of Mr. Snelus was universal, and it is a matter of some present value to briefly note earlier attempts at the utilization of lime in refining and puddling and trace the causes of their failure. The use of lime in puddling seems to date back many years. Karsten recommends the use of two to ten per cent. for improving cold-short iron; Gibbons also advocates a mixture of lime and ore and lime alone, the latter for the hottest part of the furnace; Arkinstall, on the contrary, declares that such an addition makes the iron red-short, with a tendency to crumble under the hammer, and a similar experience is recorded by Percy, who describes some experiments made at Cyfarthfa, in South Wales. This, together with the fact that in practice silicious ores are generally used for puddling, would seem to warrant the opinion that the influence of lime is unfavorable, which theoretical considerations tend to strengthen. Cinder containing a large percentage of lime is difficult to melt, and is not easily expelled from the puddled ball. Its presence in larger amounts decreases the homogeneity of the metal, and makes the product inferior in quality. Lime cinder does not dissolve the ferrous-ferrous oxide formed by the decarbonization of the pig, and therefore retards the puddling process. The failure attending the use of lime in puddling has undoubtedly prevented its employment in the Bessemer process; but as the object of the former trials was rather to reduce the loss of iron than to purify the metal, and consequently its effects in that direction were not closely studied, the earlier experiments cannot be regarded as conclusive. The conditions of the Bessemer process and its aims differ materially from those of puddling. As it is now well known that differ-

ences of temperature materially affect the chemical relations of groups of bodies, lime used either in lining the converter or by blowing it in, as Dr. Wedding suggests, may yield the remarkable results which have been recently claimed for it. The importance of the subject is such, and so few well conducted experiments are on record, that a series of trials on a large scale might lead to valuable results.

## Explosions of Carbon Dust.

Our attention has lately been called to four accidents in blast furnaces, all more or less serious, caused by the explosion of finely divided carbon. The more recent of these deserves especial mention. On Monday, the 8th inst., a blast furnace was shut down for repairs and workmen began shoveling out. By Wednesday afternoon all the loose stock was out, leaving the scaffold hanging against the sides above the boshes. Workmen were cooling the suspended mass by means of a stream of water from below, when it suddenly fell with an explosion, burning eight men, three of whom died. In the opinion of experts on the ground the explosion was caused by ignition of the finely divided carbon. After the explosion the air was full of it, and it settled on everything in the neighborhood. There is no evidence that the explosion was caused by the escape of confined steam or gas, as the mass lies as it fell, and nothing about the stack is broken or displaced. The phenomenon here noted is not unlike that to which attention was lately called so forcibly in the flour-mill explosion at Minneapolis, and the explosion in the candy manufactory in New York last winter which was attended with such loss of life and property.

Few people have a clear idea of the nature of dust explosions, and it is commonly supposed that some mysterious gas is spontaneously generated. A dust explosion is a very simple matter and easily explained. It is only the rapid, or almost instantaneous, combustion of the dust which is scattered through the air. As the products of combustion occupy many times more space than the solid particles, and as by the heat generated they are additionally expanded to many times their normal volume, we have almost exactly the same conditions that exist when gunpowder is fired; only in the case of gunpowder the oxygen necessary for the combustion is locked up in a solid form in the powder itself, instead of being derived from the air. A dust explosion will account in this case for all the phenomena of the accident. Accumulations of finely divided carbon in blast furnaces are common, and it is not unusual for them to be of considerable magnitude. In blowing out No. 4 Furnace of the Crane Iron Works, in November, 1877, for the purpose of putting in a new bell and making other repairs, a very extensive deposit of carbon was found, the greater part of which consisted of impalpable powder. In the second volume of the Transactions of the American Institute of Mining Engineers, Mr. Frank Firmstone calls attention to a similar deposit of carbon in a blast furnace. The explosion in the case under consideration is, therefore, readily explained by the supposition that one of these carbon dust deposits was disturbed, either by the fall of the scaffold or the stream of water, and at once took fire from some portion of the heated mass or by coming in contact with the atmosphere. This accounts also for the presence of the dust all around after the explosion. The number of these explosions during the past year, together with their severity, should teach manufacturers a lesson. Wherever fine dust from combustible substances is present in quantities in the air, as from coal, charcoal, coke, sugar, starch, flour, &c., there is danger, and naked lights and fires must be avoided. Sad experience has taught the danger which comes from the storage of oily rags, waste or paper, and it is time for the dangerous nature of highly divided combustibles to be known. It is quite probable that in the present instance an explosion could not have been avoided, but had it been anticipated the loss of life might have been prevented.

A dispatch from Council Bluffs, Iowa, says: "Trouble with tramps continues. A party numbering about fifty seized and boarded a freight train on the Iowa Central Railroad at Dillon last night, and one on the Chicago, Rock Island and Pacific this morning at Atlantic. Armed squads of citizens in both cases compelled them to leave the train, threatening them with 'punishment.' Why, we would ask, were the armed citizens who had rallied to the defense of the railroad content with threats of punishment? From Des Moines, Iowa, we learn by telegraph that a party of fifty tramps organized to seize and run off a train were met by citizens and militia, and, after a conflict, forty of the fifty were arrested—the rest escaping. The conclusion of the story is, however, a disappointment. The leaders were locked up, but the rest were discharged on condition that 'they would leave the town.' Why were these scourges let loose to continue their depredations somewhere else? Was there no law by which they could be made to feel that the rights of a community are not to be trifled with? In the case of tramps there has been too much threatening and too little punishment. They have been emboldened by toleration, and have learned that about the

worst penalty likely to be visited upon them is an order to 'move on.' We are heartily tired of this easy-going toleration of vagrants. Tramps, as a class, are the recipients of a great deal of a false quality of sympathy, and they are not slow to take advantage of it. We shall never be rid of this great and growing evil until we declare vagrancy a crime against society, and make its consequences terrible to the vagrants. Why this was not done years ago in every tramp-infested locality we are unable to understand.

## Boiler Explosions from Sudden Relief of Pressure.

The very important communication from Mr. J. M. Allen, which we print on another page, merits careful perusal. It describes the incidents and probable causes of the recent destructive steam boiler explosion at the Chesapeake Nail Works of Messrs. Chas. L. Bailey & Co., near Harrisburg, Pa. Mr. Allen attributes the accident to a probable error on the part of the man in charge of the feed and steam connections, in opening the connection between two boilers which were carrying steam at unequal pressures. A careful consideration of the facts in the case will show that this is probably the correct theory. Nothing that can be done to a large boiler containing a great body of water at the temperature of steam, throws such a strain upon it as a sudden lowering of the steam pressure. Looking at the steam boiler explosions of the last fifty years, we find that by far the greatest number of the destructive ones have happened at a moment when the pressure of steam in the boiler was actually falling. Given a great quantity of water at the temperature of the steam in the boiler and we have, regardless of pressure, the material for a destructive explosion. All that is necessary to produce it is the rapid opening of the throttle or safety valve, so as to cause a sudden fall in the pressure. Hence, in factories the time when the greatest number of explosions take place is just as they are starting up at 1 o'clock—after dinner. On steamboats we find the greatest danger just as they are starting from their slips or after making a landing. The fatal Westfield explosion, if we remember rightly, was a case of this kind. A more striking example happened this spring to the steamer *Magenta*. She had just made a landing at Sing Sing and was moving down the river "under one bell," the engine going at half speed. As she was entering deep water the pilot rang the "jingle" to go ahead full speed. The fireman, who for the time being was in charge of the engine, pulled the throttle valve wide open. It needs but a moment's thought upon the comparative sizes of the cylinders of river steamers and the steam room of their boilers, to show that a considerable fall of pressure must have been the almost instantaneous result, and yet the boiler exploded at once, the steam chimney, which was much corroded, giving way. On Friday of last week the back connections of the boiler on the steamer *Thomas Cornell* were blown off just as she was getting under headway. The full details of the accident are not at hand, but everything indicates that the explosion took place just after the engineer had opened his throttle wide. Were the records available, it would be easy to find hundreds of other similar instances. The theory is simple. A large proportion of the heated water, relieved of pressure, flashes into steam, striking an irresistible blow upon the boiler and tearing through the iron like a whirlwind.

## Opening of the Sutro Tunnel.

The cutting through of the Sutro Tunnel from the foot-hills of the Sierra Nevada to the group of rich mines in the Comstock lode, nearly four miles distant, of which we last week had reports by telegraph, indicate that one of the most important of the world's undertakings in mining engineering is nearing completion. This now famous lode having been placed by nature 2000 feet above the adjacent valley, the idea of penetrating the bowels of the mountain by a horizontal adit or tunnel was favorably entertained by the mining companies at work in this region, who feared it might become necessary to abandon the mines on account of the expense of pumping water, raising ore, ventilating, &c., at great depths. Moreover, as they descended further into the earth the heat became almost intolerable, sometimes reaching 120 degrees, so that laborers can only be employed in relays at short intervals. By giving an outlet to the accumulation of water, and extending facilities for working the mines, it would be possible to follow the fissure vein in its descent almost indefinitely, the ore meanwhile growing richer and richer. It was conjectured also that the water found in the mines or collected from the surface could be conducted to hydraulic engines placed in the interior and utilized as a motive power to raise water from great depths below, discharging it through the tunnel. Thus, according to Prof. Weissbach, the Comstock lode in the future may be worked profitably to a depth of at least 3500 feet, or deeper than similar workings in any part of the world. In furtherance of these views the State of Nevada, in 1865, granted to Adolph Sutro the exclusive right for 50 years to run the proposed tunnel, and subsequently a contract was made with all the leading companies, in which they agreed to pay \$2 per ton for all the ore extracted after the main tunnel is



complete and actually drains the mines; or, if they are not drained, then after a lateral drift reaches any mine. In 1866 the Federal government granted the right of way through the public domain for seven miles along the Comstock lode; also the right to select 1280 acres of land at the mouth of the tunnel, and the right or title to the mines for 2000 feet on each side of the tunnel, equal to a concession of 5080 acres of mining land. By the same authority all the mines of the Comstock lode are made tributary to the tunnel, the same as in the contract mentioned above. These measures were carried in response to recommendations and memorials signed by all the prominent mining officials, bankers, &c., on the Pacific coast. Among these latter were the late W. C. Ralston, William Sharon, John Parrott and many thousand residents.

The tunnel has been in progress some eight years, and not far from \$3,000,000 out of about \$4,000,000 required to complete the work and its railway connections have been expended up to this date. The Tunnel Company expect that a considerable town will spring up on their property, and that the results of their undertaking will be permanently profitable to themselves, the mining interests of Nevada and the whole country.

A dispatch from Paris bearing date of July 11 states that nearly all the class juries of the Exhibition have finished their work and submitted reports to the group juries. The latter have passed upon the reports thus far presented, making very few changes. Nothing is officially known of the result, but it is unofficially stated that the Americans have obtained more prizes than the citizens of any other country in proportion to the number of exhibitors. In one class all the American exhibitors have obtained medals; in another all except one. It is thought the United States will have five or six grand prizes, and a liberal number of gold medals. Foreign juries have expressed much admiration for the excellence of the articles in the American section of the Exhibition. The General Commission has increased the number of gold medals 20 per cent., silver medals 40 and bronze medals 60 per cent., all of which is good news to American exhibitors.

The report on coke manufacture by the commissioners for the second geological survey of Pennsylvania, printed on another page, contains much interesting information. It furnishes a good illustration of the great importance of the famous Connellsville coke industry. In a brief discussion of quality a very sharp line is drawn between properties due to physical structure and those due to chemical composition, a distinction which is too often neglected. A series of estimates of cost by Mr. John Fulton, M. E., will be found very useful. The figures giving the comparative value of the methods of coking in mounds, beehives and Belgian ovens are very important for purposes of comparison, although they cannot be accepted as determining the choice of methods of coking under all conditions.

The statistics of commercial failures in the United States during the first half of 1878, which are given in another column, make a startling exhibit of the actual state of trade throughout the country. As compared with the first half of 1877 the number of failures shows an increase of over 1000, or about 25 per cent., while the liabilities are \$130,000,000, against \$99,000,000 last year. A careful examination of the statistics and the discussion which accompanies them in the semi-annual report of Messrs. Dun, Barlow & Co., part only of which we publish this week, will repay all classes of our readers.

We give on another page a valuable report from the United States Consul at Copenhagen to the State Department. It will be found of much interest, as it gives with great particularity the wages, cost of living, state of trade and labor in Denmark, and also describes the currency and business methods of the kingdom.

The views of Gen. W. S. Rosecranz on our trade with Mexico, which are given this week, will be found of interest and value to those engaged in extending our export business in that direction.

Mr. James Roy, well known to the hardware trade as the founder of the old house of Roy & Co., died at his residence in West Troy, N. Y., on the 9th inst., aged 70 years. Mr. Roy was, we believe, the pioneer in the manufacture of strap and T-hinges and wrought butts in this country. He was a native of Scotland, but resided in this country for over 50 years. Besides his large interests as a manufacturer of hardware, he was well known as a manufacturer of woolen goods, being the senior member of the shawl manufacturing establishment of James Roy & Co. He has left surviving him three daughters, two of whom are married—one the wife of Capt. A. H. Sweeney, of West Troy, and the other of Capt. George Sweeney, of the British army.

It was lately reported that \$3,000,000 had been obtained in Europe to resume work on the Hudson River Tunnel to connect New York and Jersey City, but several of our prominent engineers and bridge builders who were called on by a representative of The Iron Age expressed serious misgivings as to its truth. Col. Rose, an officer of the Pennsylvania Railway Company, remarked yesterday that whether true or not the various railway corporations took no interest in the project.

### Failures for the First Half of 1878.

Messrs. Dun, Barlow & Co. send us the following report for the six months ended with June:

July 13, 1878.

The following is the number of failures in the United States and Canada for the past six months, as compared with the same period of last year, together with the amount of liabilities:

States and Territories	Second Quarter in 1878.		Total for first 6 months of 1878.		Total for first 6 months of 1877.	
	No. of Failures.	Amount of Liabilities.	No. of Failures.	Amount of Liabilities.	No. of Failures.	Amount of Liabilities.
Alabama.....	6	\$77,094	21	\$461,672	33	\$526,031
Arizona.....	1	13,000	1	42,107	1	196,325
Arkansas.....	1	92,500	2	272,600	14	1,063,300
California.....	59	523,000	139	1,343,341	170	1,456,750
City of San Francisco.....	61	990,000	115	1,835,747	76	6,802,035
Colorado.....	13	133,750	36	337,373	31	366,400
Connecticut.....	73	1,355,301	150	2,797,540	162	2,630,740
Dakota.....	2	11,000	7	85,000	1	18,900
Delaware.....	9	92,000	11	98,500	8	149,500
Dist. of Columbia.....	8	113,702	17	164,202	10	753,500
Florida.....	6	41,138	12	76,638	7	120,500
Georgia.....	39	863,772	88	1,523,568	66	703,500
Idaho.....	1	11,000	1	11,000	1	29,500
Illinois.....	78	816,430	205	4,969,131	244	4,113,800
City of Chicago.....	104	3,480,000	215	8,753,300	107	4,710,600
Indiana.....	73	1,133,000	234	3,949,549	179	2,234,385
Iowa.....	85	1,021,000	245	2,140,400	222	1,543,400
Kansas.....	7	100,800	20	444,500	31	1,260,500
Kentucky.....	1	140,800	145	4,970,268	123	3,043,970
Louisiana.....	43	986,300	90	4,080,700	31	434,518
Maine.....	39	144,900	117	803,900	54	571,000
Maryland.....	31	1,080,000	63	1,240,800	71	1,750,500
Mass.....	40	4,758,422	354	7,817,431	268	4,190,128
City of Boston.....	81	2,061,300	175	6,535,593	41	2,151,200
Michigan.....	34	1,552,554	210	4,008,025	170	4,043,328
Minnesota.....	21	180,854	55	385,995	86	1,090,515
Mississippi.....	36	241,170	70	807,160	58	590,580
Missouri.....	13	177,212	47	738,210	43	601,842
City of St. Louis.....	20	139,700	62	861,500	63	3,491,250
Montana.....	1	1,000	1	1,000	1	1,000
Nebraska.....	17	91,300	66	472,300	28	201,300
Nevada.....	4	1,000	7	107,137	40	400,320
New Hampshire.....	34	138,500	57	276,800	56	602,450
New Jersey.....	40	634,600	77	1,083,800	87	1,950,828
New Mexico.....	3	2,300	2	2,300	1	1,000
New York.....	207	3,124,725	515	8,538,844	571	9,848,590
City of New York.....	151	7,010,000	424	23,395,412	434	16,345,064
North Carolina.....	36	264,500	58	899,400	55	411,600
Ohio.....	113	1,385,000	209	6,831,233	190	3,130,632
City of Cincinnati.....	60	1,804,140	106	3,212,080	15	1,813,800
Oregon.....	205	5,489,923	420	11,714,554	300	6,052,957
City of Portland.....	70	1,414,122	135	5,402,466	83	2,213,875
R. Island.....	34	39,322	67	958,225	54	2,183,497
S. Carolina.....	16	100,138	38	513,501	53	244,490
Tennessee.....	49	311,154	123	1,546,000	66	602,450
Texas.....	49	478,400	145	1,873,510	77	1,005,620
Utah.....	3	42,500	4	43,700	5	30,000
Vermont.....	1	305,000	62	1,270,500	40	800,865
Virginia.....	41	310,144	62	612,044	52	430,734
Washington Territory.....	1	1,000	1	1,000	1	1,000
W. Va.....	10	132,000	23	227,736	36	381,026
Wisconsin.....	49	107,022	99	1,398,016	70	1,143,950
Wyoming.....	2	14,000	4	24,000	1	1,000
<b>Total.....</b>	<b>2,470</b>	<b>18,753,940</b>	<b>5,825</b>	<b>130,832,766</b>	<b>4,749</b>	<b>99,606,171</b>
Canada.....	392	4,407,800	947	13,508,730	1,230	15,151,837

In order to keep a record by quarters for the purposes of comparison, and also to show the average liabilities, the following table is inserted. It will be seen that the failures and liabilities for the second quarter just closed are much less than for the first quarter of the year, but that the figures for both quarters are far above the usual amount:

First Quarter.			
Years.	No. of Failures.	Amount of Liabilities.	Average.
1875.....	1,083	\$4,176,953	\$21,784
1876.....	2,806	6,644,156	23,608
1877.....	2,869	54,538,074	19,010
1878.....	3,355	82,076,826	24,464
Second Quarter.			
1875.....	1,581	33,607,313	21,295
1876.....	1,794	43,771,273	24,398
1877.....	1,880	45,008,097	23,972
1878.....	2,470	48,753,940	19,738
Third Quarter.			
1875.....	1,771	54,228,237	30,534
1876.....	2,450	47,457,371	19,534
1877.....	1,816	42,346,085	23,318
Fourth Quarter.			
1875.....	2,405	70,888,850	29,475
1876.....	2,042	38,844,803	17,064
1877.....	2,307	46,717,680	21,117
Total for the Year.			
1875.....	7,740	301,000,333	37,960
1876.....	9,092	191,117,785	21,020
1877.....	8,872	190,669,936	21,491

The failures in the United States for the first six months of the present year are 5825, as against 4749 in 1877, an increase of over 1000 in number, equal to nearly 25 per cent. The liabilities for the first half of 1878 are \$130,000,000, as against \$99,000,000 for the same period of last year, a percentage of increase still greater. These figures are of very grave import if taken as an indication of the state of trade, for never before in an equal period in the history of the country have business misfortunes been so numerous or aggregating an amount of loss by bad debts so great. But before accepting these statistics as a true test of the present condition of business, there are some points to be considered which might materially mitigate the unfavorable conclusions which otherwise would be inevitable. That any substantial progress toward business prosperity could have been made in the face of the adverse circumstances of the past six months would be a matter of surprise; on the contrary, it is a subject for congratulation that, considering the preceding period of depression and distress, the business misfortunes of the half year have not been greater in view of all that has occurred therein. These adverse conditions may be briefly stated as follows:

1. An unusually open winter, resulting in a greatly reduced absorption of heavy goods, which are to a large extent being carried over for the entire year; the want of frost rendering almost impassable country roads, and thus materially interfering with the deliveries of produce, and the consequent collections of outstandings until months later than usual. That great embarrassment and not infrequent failures were caused by these circumstances is undeniable.

2. The discussions in and out of Congress in relation to the silver bill, and the anxiety as to the effects of the numerous financial questions that occupied so large a space in the public mind, seriously impaired confidence; and aside from the freedom with which repudiation and kindred subjects were discussed, to the great injury of mercantile morality, business facilities and operations were materially restricted by the uncertainty and doubt as to the future which prevailed during so many months.

3. The possibility of important changes in the tariff was not without its influence, and to some extent contributed to the condition

### Condition of the Blast Furnaces of the United States, July 1, 1878.

(Compiled for The Iron Age).

Location.	CHARCOAL.					ANTHRACITE.					BITUMINOUS OR COKE.				
	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New England.....	18	3	210	15	976	1	.....	1	180	.....	.....	.....	.....	.....	.....
New York.....	13	3	180	10	669	43	19	4,075	24	5,610	.....	.....	.....	.....	.....
New Jersey.....	.....	.....	.....	.....	.....	16	5	1,170	11	2,550	.....	.....	.....	.....	.....
Pennsylvania.....	37	14	589	23	986	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh Valley.....	.....	.....	.....	.....	.....	50	32	7,200	18	3,650	.....	.....	.....	.....	.....
Schuylkill Valley.....	.....	.....	.....	.....	.....	50	17	3,025	33	5,460	.....	.....	.....	.....	.....
Upper Susquehanna Valley.....	.....	.....	.....	.....	.....	24	7	1,230	17	2,760	.....	.....	.....	.....	.....
Lower Susquehanna Valley.....	.....	.....	.....	.....	.....	37	15	2,615	22	2,895	.....	.....	.....	.....	.....
Pittsburgh.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	7	3,980	5	1,455
Allegheny Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	4	430	6	600
Shenango Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	7	1,475	24	4,930
Yough'eny Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	3	975	2	400
Juniata and Conemaugh Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	13	2,470	8	1,030
Maryland.....	17	5	305	12	550	3	.....	3	450	4	.....	.....	4	455	.....
Virginia.....	28	2	86	26	1,130	1	.....	1	140	5	2	220	3	250	.....
North Carolina.....	7	.....	.....	7	274	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia.....	6	.....	.....	6	443	.....	.....	.....	.....	.....	6	3	1,075	3	740
Ohio.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	8	2,250	12	2,635
Eastern, Central and Northern.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	8	2,010	15	3,950
Hocking Valley.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	10	1,385	3	545
Hanging Rock.....	32	16	1,280	16	1,290	.....	.....	.....	.....	.....	16	5	590	11	2,085
Miscellaneous.....	3	.....	.....	3	235	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hanging Rock.....	7	5	450	2	140	.....	.....	.....	.....	.....	3	3	1,050	.....	.....
Western region and Miscellaneous.....	8	.....	.....	8	566	.....	.....	.....	.....	.....	1	1	300	.....	.....
Tennessee.....	17	3	300	14	918	.....	.....	.....	.....	.....	7	2	350	5	2,080
Georgia.....	6	.....	.....	6	375	.....	.....	.....	.....	.....	3	2	275	1	120
Alabama.....	11	3	465	8	775	.....	.....	.....	.....	.....	2	2	350	.....	.....
Indiana.....	1	.....	.....	1	140	.....	.....	.....	.....	.....	8	1	150	7	1,210
Illinois.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	4	1,250	8	2,990
Michigan.....	31	5	760	26	3,475	.....	.....	.....	.....	.....	4	.....	.....	4	1,050
Wisconsin.....	12	3	375	9	1,030	.....	.....	.....	.....	.....	3	2	700	1	300
Minnesota.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Missouri.....	11	2	420	9	1,295	.....	.....	.....	.....	.....	8	2	450	6	2,200
Texas.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	269	64	5,420	202	15,267	225	95	19,315	130	23,605	217	89	21,735	128	29,025

of uncertainty that has been the prevailing characteristic of the half year.



# AMERICAN SCREW CO.,

Providence, R. I.,

**MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,  
AND INCREASING THE ASSORTMENT DAILY.**

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

## INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

### REPORT ON AWARDS.

PHILADELPHIA, November 8, 1876.

Product: **Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.**

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz:  
**Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.**

G. L. REED. Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz,  
Jas. Bain,  
Chas. Staples,

G. L. Reed,  
J. D. Imboden,

J. Diffenbach,  
Dav. McHardy.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.  
Given by authority of the United States Centennial Commission.

[L.S.] J. L. CAMPBELL, Secretary.

A. T. GOSHORN, Director-General.  
J. R. HAWLEY, President.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all

1776.



1846.

Patented August 30.



Section at Line A

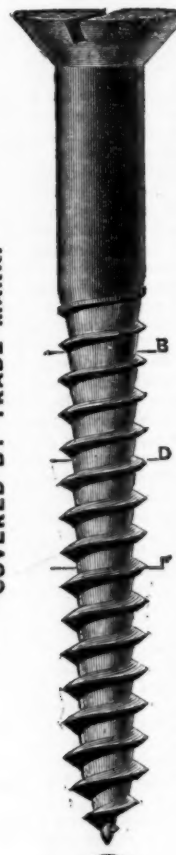
Section at Line C D

Section at Line E F

1876.

Patented May 30.

COVERED BY TRADE MARK.



Section at Line A B

Section at Line C D

Section at Line E F

Estimated to be FIFTY PER CENT. stronger than a Screw as Commonly made.

the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

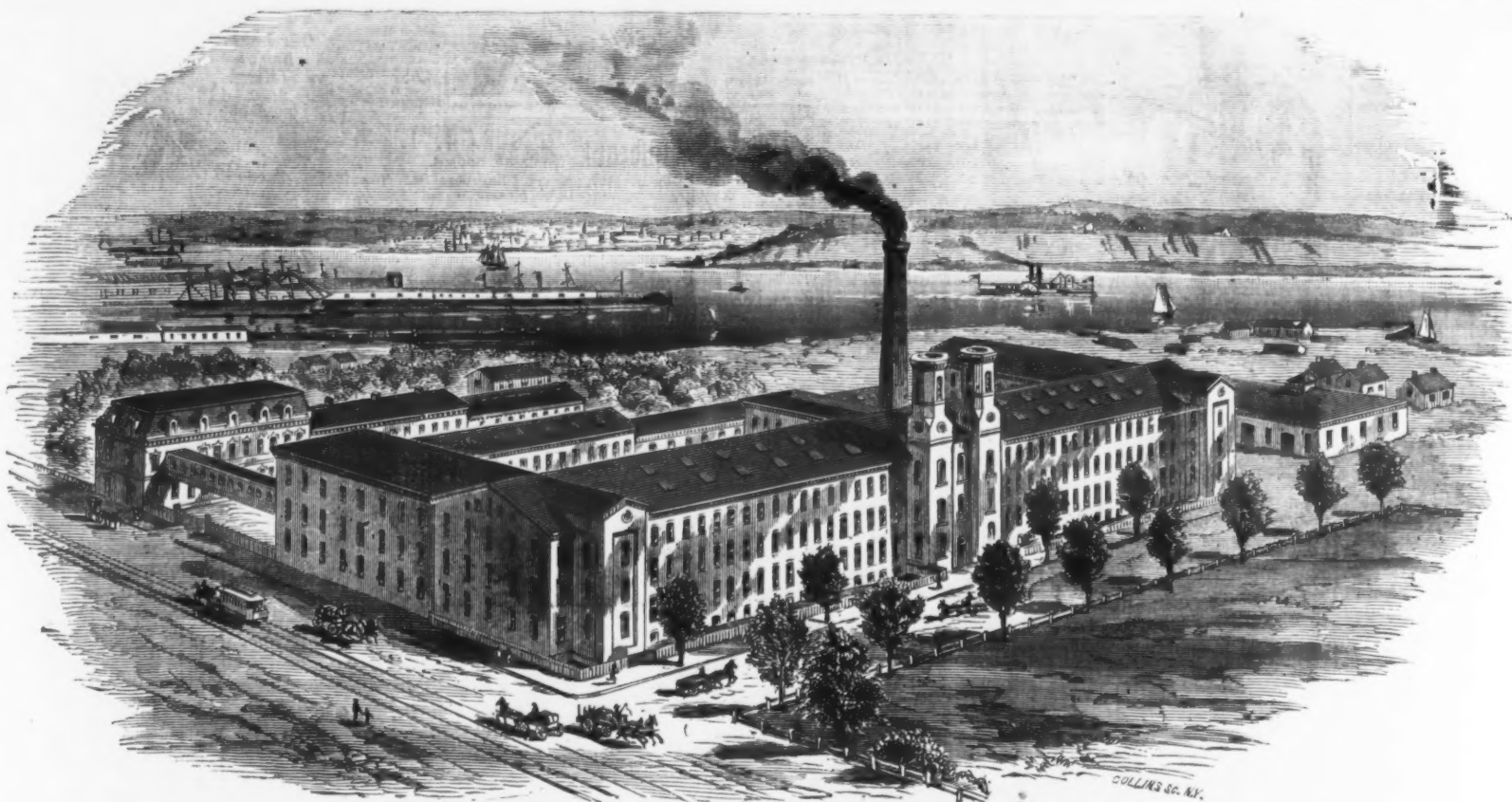
It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

### CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

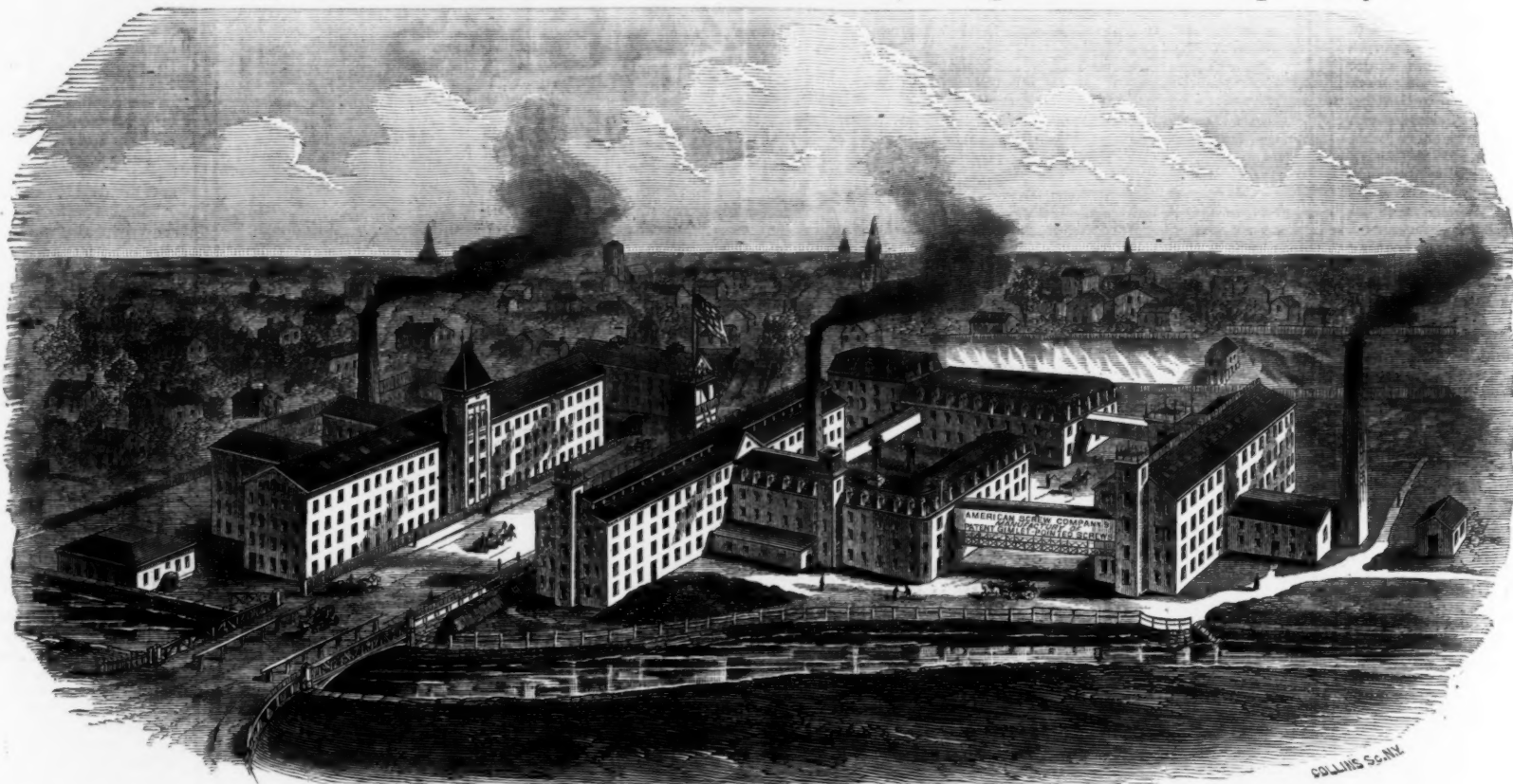
On the opposite page will be found illustrations of the various Works of the company.





**NEW ENGLAND MILL.**

Containing Machinery for the Production of 22,500 gross of Screws per day.



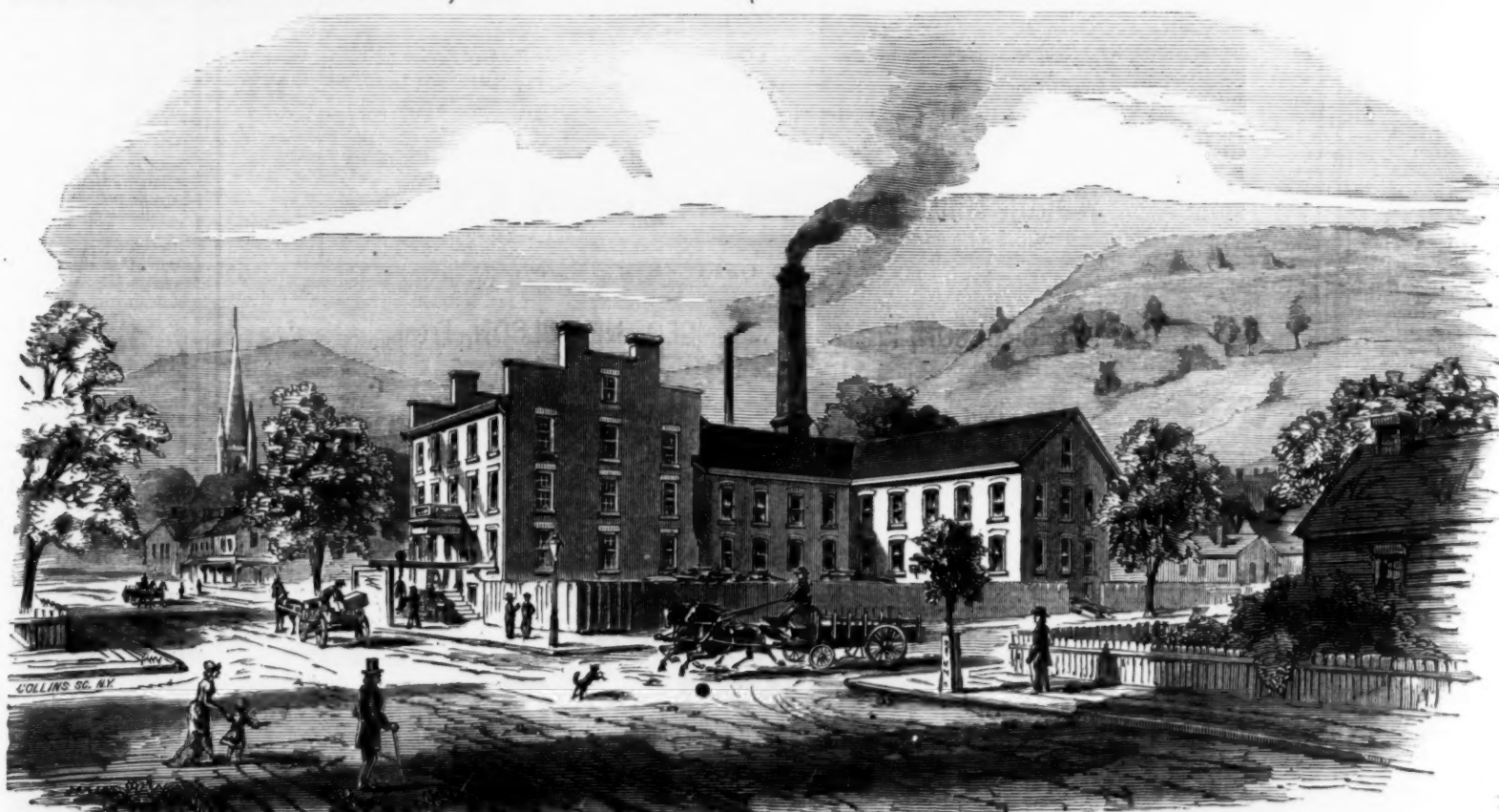
**BAY STATE AND EAGLE MILLS.**

**BAY STATE MILL,**

For the Production of Stove Bolts, Tire Bolts, Rivets,  
Lock and Machine Screws, &c.

**EAGLE MILLS.**

Capacity 22,500 gross Wood Screws per day.



**WORKS AT DUNDAS, ONTARIO, CANADA.**

Capacity, 4000 gross Screws per day.



## Coke Manufacture in Pennsylvania.

In a special report on coke, just published by the board of commissioners for the second geological survey of the State of Pennsylvania, a very full account is given of the Connellsville coke trade, with much valuable information relative to the various methods of making coke, the cost, &c.

As yet, what is known as the "Connellsville region," lying chiefly within Westmoreland and Fayette counties, Pennsylvania, is the great coke-producing district. The reasons for this are that the coal is very free from sulphur and slate, is soft and easily mined, and can be manufactured into coke more cheaply than perhaps any coal found elsewhere. The cost of cutting this coal in 1875 was but one cent a bushel (only about 28 cents a ton), and it was, at that time, made into coke and delivered on the cars for \$1.37 per net ton.

This coal bed ranges from 8 to 11 feet in thickness and extends, almost without a fault, over a district three miles wide and 50 miles long. Previous to 1865 coke was little known or used in the country, but since that time its manufacture has enormously increased, and without doubt it is to be the fuel, at least for metallurgical purposes, in the future. From the work referred to we extract the following table, which illustrates the extent of the development up to 1875. The 1st column of figures represents the number of works; 2d column, number of ovens; 3d column, number of weekly shipments in cars of 600 bushels:

Fayette county branch, P. & C. R. R.	7	646	375
Southwestern Pennsylvania R. R.	9	630	374
Mount Pleasant branch P. & C. R. R.	21	1,349	860
Hickman Run branch P. & C. R. R.	8	953	564

Total for region.....45 3,578 2,172

Over 2000 men are employed in manufacturing this coke, and it is shipped to all parts of the country, even as far west as California.

The qualities of a good coke are a bright silvery color, clear metallic ring (combined with an open and porous structure) and freedom from impurities. All bituminous coals are not suitable for the manufacture of coke even when they are similar in chemical constitution to good coking coals. About the only way to determine a doubtful case is to make a practical test, which can usually be readily and cheaply done on a small scale. It has been the experience of all who have given the subject thorough and practical investigation, that a coal which does not make good coke in a common pit or beehive oven will not yield a satisfactory product in any oven. This, it will be understood, applies only to the physical structure of the coke and not to its composition. If the coke be poor because full of sulphur, or weak on account of the presence of slate, the trouble can be remedied by washing the coal before coking, and in all experiments tried in this vicinity so far this most important want has not been satisfied.

The ovens in use generally are in the form of a beehive, being almost 6 feet high and 12 feet in diameter. The raw coal is thrown in through an opening in the top and air is admitted through a door at the side, promoting sufficient combustion to drive off the hydrocarbons and leave the fixed carbon and ash. The door at the side is gradually closed up, and finally the top is also closed and the coke left for a time, after which the door is opened and the glowing mass cooled with water from a hose. The coke is called 24-hour or 48-hour or 72-hour, according to the time occupied in making it, the longer time producing a better and harder coke. The yield of coke is greater in bushels, though of course less in tons, than the coal used. For the beehive ovens used at Connellsville the following figures are given for each charge:

100 bushels of coal @ 76 lbs. per bushel.....	3.39
120 " coke @ 40 ".....	1.14
Loss by coking.....	1.25
Yield of coke, 63 per cent.; loss, 37 per cent. This makes the consumption one and six-tenths tons of coal to one ton of coke. The loss of carbon is about 9 per cent.	
An estimate of the cost of this method of coking from actual results gave these figures:	
100 bushels of coal, burning cost.....	\$1.00
Hauling and putting in oven.....	1.00
Drawing and loading on cars.....	.70
Total.....	\$2.70

The production, from the figures given above, would be 120 bushels of coke, equal, at 40 pounds to the bushel, to 2.4 net tons. This makes the actual cost on the cars \$1.15 per net ton. An analysis of this coke gives:

Water at 212 degrees.....	.030
Volatile matter.....	.460
Fixed carbon.....	\$9.376
Sulphur.....	.821
Ash.....	9.113
Total.....	100.000

Color of ash, reddish brown. This analysis will be found useful for comparison, it being a fair average of the product of this district. When coal requires washing to remove slate and sulphur, a slight addition is made to the cost of the coke. Various forms of washing machines are in use. A detailed account of the method and cost of washing at the works of Messrs. Carnegie & Co., near Pittsburgh, places the cost of washing at about one-half a cent per bushel, or 12 cents per ton of 2000 pounds. The total cost of the four washers and machinery for working them was about \$5000. Mr. John Fulton, M. E., in a report on the methods of coking, gives these comparative estimates of cost, assuming the raw coal to be worth \$1 a ton at the ovens. The figures form a most valuable basis for comparing the different methods in common use:

I.—PITS OR MOUNDS.	
Holidaysburg and Bennington, 1.67 tons coal, at \$1.....	\$1.67
Labor, wood, &c.....	.70
Total cost of one gross ton of coke.....	\$2.37

II.—BEEHIVE OVENS.	
Connellsville, 1.60 tons, at \$1.....	\$1.60
Labor, charging and drawing.....	.61
Total.....	\$2.21

BROAD TOP, KEMBLE COAL AND IRON CO.	
Coal, 1.58 tons, at \$1.....	\$1.58
Labor, supplies, &c.....	.60
Total.....	\$2.18

III.—BELGIAN OVENS—CAMBRIDGE IRON CO.	
Holidaysburg and Bennington, 1.42 tons coal, at \$1.....	\$1.42
Labor, supplies, &c.....	.45
Total.....	\$1.87

The cost of the coal and labor of coking



## THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.

## TUCKER &amp; DORSEY, MANUFACTURERS.



We make Till either for Cash or Scrip.

one gross ton of coke by the three methods—just considered is as below:

- I. Pits or mounds, \$2.37.
- II. Beehive ovens, \$2.20.
- III. Belgian ovens, \$1.87.

This comparison takes no account of the interest on the investment required by the different methods. Allowing for this at 10 per cent., Mr. Fulton makes this comparison:

- I. Mounds or pits, \$2.37 3-5.
- II. Beehive ovens, \$2.33 3-5.
- III. Belgian ovens, \$2.06 3-5.

The estimated cost of the plant for the production of 100 tons of coke per day (exclusive of trucks, cars, &c.) is:

- I. Pits or mounds, \$1000.
- II. 80 beehive ovens, \$32,000.
- III. 65 Belgian ovens (including engine), \$55,300.

These figures, while correct for the examples given, do not imply that the Belgian ovens are always the most desirable, because it is necessary to adapt the oven to the peculiar treatment required by each coal, and that is a matter not easily determined except by experiment.

## American Stoves at the Paris Exhibition.

The special correspondent of *The Iron Age* at the Paris Exhibition sends us the following notes of the American stoves there shown:

## ABENDROTH BROS.

make the finest display in the American Department, and as good as any I have seen in the Exposition. The castings are very fine, being smooth, with sharp edges, well-defined corners and miters, and very distinct in the ornamentation. The character of the castings is attracting a good deal of attention from Englishmen especially, and they will hardly believe that they have not been polished, and with characteristic effrontery they ask, in a tone that implies it must be so, "You use Scotch pig?" and on being told "No, not a pound," look incredulous. A fine medallion of the late Pope Pius IX, made from a plaster mold and to which nothing has been done, not even brushed, is very good; the tracery in the robe is very distinct. The ornamental work in iron that they exhibit does them much credit. The vases that stand at the entrance are graceful in design and well executed. This firm's exhibit of stoves includes over 40 styles, and is described by them as a general line. It includes the Uncle Sam, Companion, Saxon, Opera, Derby, Fire Side, Toy, Cotton Plant and many others. The display is altogether creditable and will do much to popularize American stoves on the Continent.

## RATHBONE, SARD &amp; CO.

have a very good, though not very large, exhibit, their application for space being necessarily cut down. They confine their exhibit to stoves adapted to burning the European bituminous coal and coke, and visitors who are accustomed to use the rude and wasteful stoves which are made in Europe express their admiration and wonder at the beauty and convenience of these American stoves. Their exhibit comprises the Prize Medal Cook, with reservoir and closet, a solid-looking stove, which even an Englishman would approve as having strength enough for soft coal. Their Delmonico Range, with low closet, high closet and low reservoir, is a very fine article, shows well and attracts much attention. All the doors have rich-looking plated panels, and all their exhibit is adorned with bright surfaces, nickel-plated knobs, &c. Other less expensive stoves are also shown, which appear better adapted to the working classes who earn light wages.

One of the most prominent features of their exhibit is a Dauntless base-burning magazine stove for soft coal. This class of stove for hard coal has long been in successful use; for soft coal the difficulties to overcome are much greater, but they have not been insuperable, and if the merits of this construction were as well known in England as they are in our Western States, it is not unreasonable to suppose that a change in English methods of heating houses would result.

## LEIBRANDT &amp; McDOWELL,

Philadelphia, exhibit some 23 cook and heating stoves of various styles and patterns. These were sent over with the Philadelphia and Reading Railroad exhibit, and are intended to show how anthracite coal is burned in America. Part is contained in the agricultural section and part outside of the machinery department, mounted on the huge lump of coal sent over by the Reading Coal and Iron Co. Among the styles shown is the Cosy, a small range, the Reliance, Victor and Improved Victor, all ranges, and the Charm Cook. In parlor stoves they have the Index, Sun, Radiant and Octagon.

## THE RETORT GAS STOVE CO.,

Providence, R. I., exhibit five of their stoves, one of sheet iron, 2 feet high, for warming purposes; one with a bake oven, and three for general use—cooking, heating, boiling, &c. The heating stove is in operation.

## THE OPEN STOVE VENTILATING CO.

This house show one of their well-known stoves, the "Fire on the Hearth," which has been so fully described in *The Metal Worker* that no details need be sent by mail.

The last job of work at the Springfield armory under this year's appropriation was finished last week, and the works were shut down for a week to allow the inventory to be taken. It rarely happens that the work comes out so even at the end of the fiscal year as in this case. Work was resumed again this week on the appropriation of \$150,000 for the year that began July 1. As this appropriation, though \$50,000 larger than last year's, is for several months longer time, it does not allow the same force to be employed that was at work when the last year closed. In some departments the reduction of force is greater than in others, the operations performed by one man being in some instances increased. Approximately a fifth of the men at work last month cannot be called in now. It is expected to turn out 70 finished guns a day through the year, and the number may be increased to some extent through the manufacture of militia arms and other causes.

## NICHOLSON FILE CO.,

Sole Manufacturers of

## FILES AND RASPS

HAVING THE INCREMENT CUT.

ALSO

## Filers' Tools &amp; Specialties.

"Nicholson File Co.'s" Files and Rasps,

"Double Ender" Saw Files,

"Slim" Saw Files,

"Racer" Horse Rasps,

Handled Riffles,

Machinists' Scrapers,

File Brushes, File Cards,

Surface File Holders,

Vise File Holders,

Stub Files and Holders,

Improved Butchers' Steels.

Both our Treatise and our First or No. 1 Catalogue are now ready for distribution; the former to our customers, free of charge, with first goods ordered, the latter will be sent upon application to anyone interested.

## Manufactory and Offices at Providence, R. I.

EXECUTIVE OFFICERS:

W. T. NICHOLSON, Pres't.

GEO. NICHOLSON, Treas.

Incorporated 1864.

Capital Stock, \$400,000.

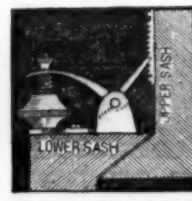
## MUZZLES! MUZZLES! MUZZLES!

## E. OLIVER,

106 and 108 Beekman St., New York,

Manufacturer of

Dog Muzzles, Wire Cloth and Netting, Moulder Riddles, Decoy Rat and Mouse Traps, Wire Cloth Covers, Flour and Meal Sieves, &c., &c., At the Lowest Prices.



NONESUCH Self Locking and Burglar Proof Window Locks.

Cheapest and best in the market. Send 25c. for sample, price list, &c., to FRED. J. HOYT 733 Broadway, N. Y.

Patented July 10th, 1877.



**B. KREISCHER & SON,**  
**New York Fire Brick &**  
**STATEN ISLAND**  
**CLAY RETORT WORKS,**  
 Established 1845.  
 Office, foot of Houston Street, East River,  
 NEW YORK.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.  
 Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

**NEWTON & CO.,**

Successor to  
**PALMER, NEWTON & CO.,**  
 ALBANY, N. Y., Manufacturers of

**FIRE BRICK**  
**Stove Linings,**  
**Range and Heater Linings**  
 Cylinder Brick, &c., &c.

**M. D. Valentine & Bro**

Manufacturers of  
**FIRE BRICK**  
**And Furnace Blocks**  
**DRAIN PIPE & LAND TILE.**  
**Woodbridge, - - - N. J.**

**A. HALL & SONS, Perth Amboy, N. J.**

ESTABLISHED 1845.  
**HALL & SONS, Buffalo, N. Y.**  
 ESTABLISHED 1855.

**FIRE BRICK**  
 of reliable quality for all purposes, manufactured at the best New Jersey Fire Clays. Also, Architecture Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick and Diamond Building Brick.

**Brooklyn Clay Retort**

**FIRE BRICK WORKS.**  
 Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Tile, Cupola Brick, &c. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burt's Creek, New Jersey. Manufacture: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 30 Van Dyke St.

**Watson Fire Brick Manufactory**

ESTABLISHED 1835.  
**JOHN R. WATSON, Perth Amboy, New Jersey.**  
 Manufacturers of  
**FIRE BRICK,**  
 For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.  
 FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE

**HENRY MAURER,**

Proprietor of the  
**Excelsior Fire Brick & Clay**  
**Retort Works,**  
 Manufacturer of FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS.  
 WORKS: PERTH AMBOY, NEW JERSEY  
 Office & Depot: 418 to 422 East 23d St., N. Y.

**TROY FIRE BRICK WORKS**

Troy, N. Y.,  
**JAMES OSTRANDER & SON,**  
 ESTABLISHED 1845,  
 Manufacturers of  
**FIRE BRICK,**  
 Tiles, Tiles, Blast Furnace Blocks, etc. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Established 1864.

**GARDNER BROTHERS,**  
 MANUFACTURERS OF  
**STANDARD SAVAGE**  
**Fire Brick, Tile & Furnace Blocks,**  
 OF ALL SHAPES AND SIZES.

**Clay Gas Retorts and Retort Settings,**  
 AND  
 Miners and Shippers of Fire Clay.  
 OFFICE: 35 Penn Ave., Pittsburgh, Pa.  
 WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

**BORGNER & O'BRIEN,**

Manufacturers of  
**Fire Bricks,**  
**Clay Gas Retorts,**  
**Retort Settings,**  
**Tiles, Blocks, &c., &c.**  
 23d St., below Vine,  
 PHILADELPHIA.  
 Eighteen years' practical experience.  
 CYRUS BORGNER. WM. J. O'BRIEN

**Crane & Chapuis,**  
**FELT MANUFACTURERS.**

Polishing Felts of every description.

31 & 33 Courtlandt St., PATERSON, N. J.

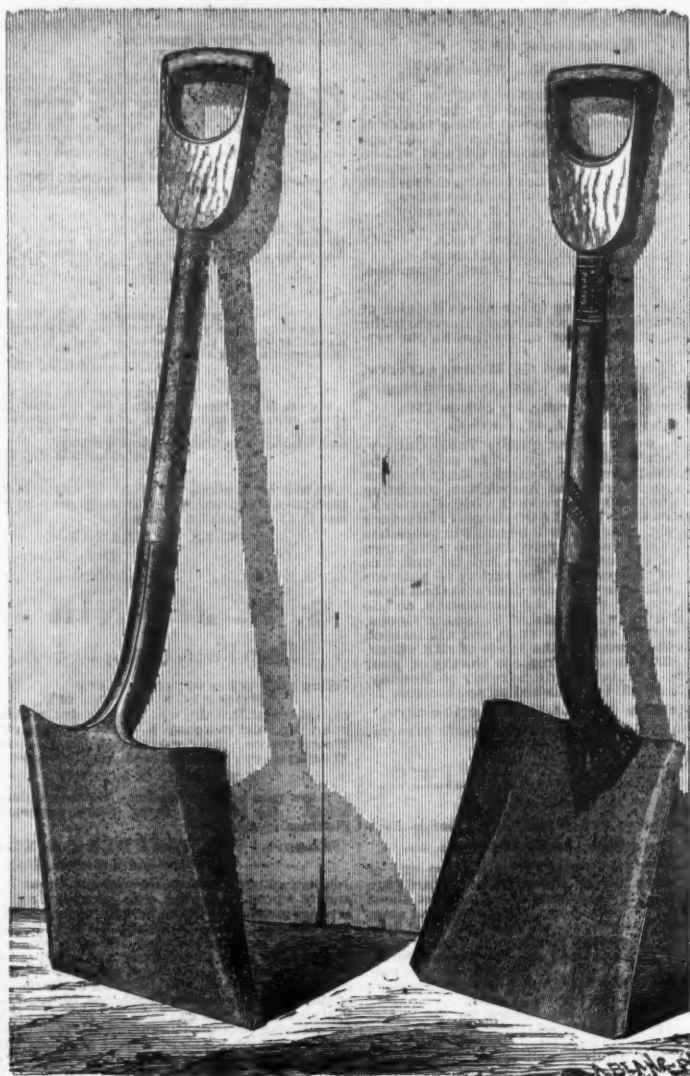
93 Chambers St. Reade St., 77.

**E. S. DODGE**  
**PRINTING**  
 COMPANY.

HUTCHINGS, Supl. NEW YORK

## B. ROWLAND & CO.,

### PHILADELPHIA.



## THE OXFORD PATENT WELDED Solid Cast Steel Shovel.

### OIL TEMPERED.

The Oxford Patent Welded Solid Cast Steel Shovel, as now furnished by us, is a new article of manufacture, of a single plate of Cast Steel, without rivets, welded by the Antrim process, with smooth surfaces front and back, and with socket continued some distance up the handle, completely encircling it in the manner of a ferrule, thus insuring a perfectly straight handle in every instance, and securing the qualities of absolute perfection of strength, and the greatest beauty of construction possible. Taken altogether, our methods will be found to obviate all the defects now so patent in all other Shovels, even those of first-class manufacture, and we will guarantee for them superior strength in parts usually the weakest, perfect symmetry and regularity of appearance, and wearing quality one-third greater than those of any other now made.

The same will apply to our Oxford Patent Welded Solid Cast Steel Spade, Long Handle Round Point Shovel and D Handle Moulder Shovels in every respect.

## OXFORD Warranted Cast Steel.

Goods of this stamp are made of the very best material, and are warranted. We will always replace them with new ones in every case where reasonable satisfaction is not given.

**B. ROWLAND & CO.,**  
 CITY OFFICE,

27 North Fifth Street, Philadelphia, U. S. A.  
 Works at Frankford, Phila., U. S. A.

NEW YORK WAREHOUSE, 100 Chambers St.

**MACOMBER, BIGELOW & DOWSE,**  
 Nos. 156 and 164 Oliver St., Boston, Mass.,  
 NEW ENGLAND AGENTS.

## THE PARIS EXPOSITION.

American Machinery.

(From our Special Correspondent at Paris).

The display of our machinery at Paris, judged either by our ability or by the show at previous exhibitions, is very small. Machine tools are almost entirely wanting. Neither Wm. Sellers & Co., whose exhibits were so attractive at Vienna in 1873 and at Paris in 1867, nor Bement nor Pratt & Whitney have a single piece of machinery in the exhibition. Brown & Sharpe Mfg. Co. have a number of their elegant metal-working tools in Machinery Hall. Allen & Roe of New York have a power riveting machine, and Henry Devens, of Brattleboro', Vt., has an exceedingly good automatic screw-cutting machine. In addition to these the exhibits of Bliss & Williams of machines for working metals, and of J. A. Fay & Co. of wood-working machinery, are especially good and noticeable. While our exhibit is small, what is shown is in no way inferior to the exhibits in other sections. Some of it is, in fact, unquestionably superior to any other machinery of the same class in the exhibition, and is being rapidly sold to European houses. This is a fact that is worthy of special notice. The entire exhibit of Bliss & Williams is sold and duplicate orders taken in many instances, and not to colonial houses, but to the largest houses in Paris and other parts of France using the class of tools made by them. J. A. Fay & Co. have made large sales of their machinery, not to go to South America or Australia, but into the very best shops in England and Scotland, in France, Germany and Belgium. There is in the Exhibition a fine display of machinery for making rubber goods and for boot and shoe manufacture, but this hardly comes within the scope of our article.

We shall notice first the fine exhibit of Bliss & Williams.

167 Plymouth street, Brooklyn. The machines exhibited by this house for working tin plate and other metals are the only ones of the kind in the Exposition, and when they are in operation attract a crowd, not only of the curious, but of the interested as well. Samples of deep stamped ware in the American Department, and others in connection with the exhibits of certain manufacturers of tin plate in the English section, the stamping being done in America, have excited a good deal of surprise at their depth and smoothness and led to a desire to know more as to the method of manufacture, and this has led to the close inspection of the machinery of this firm. The working is a complete surprise. Tin plate is manipulated in a way that manufacturers of machinery on this side have declared impossible, and as a result, Bliss & Williams have not only long ago sold every piece of machinery they have in the Exposition, but have duplicated orders for some of the machines several times. The machines whose operations are the most interesting are the No. 3 drawing press and No. 5 spinning lathe. A sheet of tin is fed to the first, from which it comes shaped as a pan. It is then passed to the lathe, in which the wrinkles are first smoothed, and then a lever is touched and the pan is trimmed. Reversing the movement, the pan is curved or braided and comes from this machine complete. The two operations require less than a quarter of a minute. These machines are sold to Japy & Co., the largest manufacturers of stamped goods in France. Another machine is their No. 2 incline power press for making fruit can tops and bottoms. This is a new machine in France. The top is cut, formed, and a cap for a smaller size can formed at one stroke of the press. This press is sold to the largest box and can manufacturers in this country. The cutting, drawing and stamping press for making blacking and other boxes is perhaps the most important one shown in some respects. This press has three distinct movements—one to cut the blanks, one to draw the articles and one to put the impression on the bottom when the plunger is nearly down. The working of this press is so different from the preconceived ideas of French and other manufacturers of this class of machines that they will not believe it when told, and will scarcely credit the evidence of their own senses. One of the most celebrated French builders of hand machinery for doing similar work had heard of it, and at once declared that it was impossible for it to do what was claimed, but his curiosity led him to see the press. It was not working when he first saw it, and he still was loud in his assertions that no box or pan could be made in one operation. While he was thus delivering himself the engine started. A blank was placed in position in the press, the treadle was touched, the machine did its work and the result was handed to him. The look of complete surprise struggled with an attempt to look pleased, and he left without saying a word. Later in the day he appeared and asked the attendant to let him look at the machine with the wheel removed that he might see the operation of the clutch. The sardine box and cover machines are very important to France. The box is made in one piece, the cutting, drawing, and stamping impression being done at one pass. This firm have patents in Europe on this machine, and arrangements have been made with one of the leading houses in France to manufacture on a royalty. Bliss & Williams are certainly deserving of a great deal of credit for their fine display, and for the especial characteristic of the tools, which is not only labor saving but time saving as well, and, above all, the combining of several machines in one, doing the work perfectly and saving an immense deal of handling which all acquainted with machinery know to be one of the most useless as well as expensive parts of manufacturing.

BROWN & SHARPE MFG. CO.,

Providence, R. I. The display of this well-known firm consists of universal and plain milling machines, grinding, screw and tapping machines, screw finishing and polishing machines, reels, assorters, scales and testers for roving, and yarn for cotton and woolen manufacturers; cutters for gear wheels, taps, reamers, twist drills, &c. The high character of the manufactures of this

firm for accuracy of workmanship and fitness for the purpose designed is so well known that words of praise for their exhibit seem useless. Though none of the tools are in operation, the beauty of their design, the skill in construction and the care in manufacture are very apparent. The universal milling machine is especially noteworthy for the excellence of its workmanship and its adaptation to every variety of work that such a tool is ever called upon to perform. In addition to the more common kinds of plain surface milling, some of its applications may be enumerated as follows: Cutting of bevel and spur wheels, worm wheels and racks; milling of circular arcs and slots; squaring of bolt heads and nuts; fluting of taps, reamers, &c., cutting the teeth of mills, either straight or spiral; slotting of screw-heads; making of twist drills; drilling of holes on the periphery or face of plates; die-sinking, milling key-ways in spindles, &c.; proving, as its name indicates, a machine adapted for universal application to milling purposes. Their universal grinder is an exceedingly substantial and well-studied machine; its details are well arranged and the variety of work to which it is adapted is very great. Their grindstone turning device is also worthy of notice as an arrangement for instantly and automatically doing one of the most disagreeable things of a workshop. Among the smaller tools in their exhibit must be named a large variety of milling machine cutters, which are so constructed as to admit of repeated sharpening without destroying the accuracy of the original cutting of their teeth. This is a very important peculiarity and deserving of especial notice. In the manufacture of small machinery many of the parts are of irregular outline, requiring expensive cutters to produce them. These cutters soon become dulled and then require to be annealed, recut and rehardened at a cost nearly equal to new ones, while the steel of which they are made suffers injury from reheating, by annealing and hardening. The Brown & Sharpe cutters can be sharpened by grinding without changing their form. The method by which they are made also admits of exact reproduction of form in duplicating cutters. The operation of grinding can be repeated until the strength of the teeth becomes impaired, thus causing them to greatly outlast cutters produced in any other way. The entire exhibit is very creditable to American ingenuity, and is an indisputable evidence of the high character of the work in this line we are capable of producing.

J. A. FAY & CO.,

of Cincinnati, Ohio, make a very fine display of wood-working machinery, consisting of 15 machines, or 17, if certain double machines are counted as two. This exhibit is not a reproduction of the tools shown at previous exhibitions, but is largely of new machines, seven of them having been brought out since the Philadelphia Exhibition two years ago. The exhibit includes some of the most comprehensive machines in the Exhibition, viewed in the light of the different operations executed. One of the most perfect examples of this is their Patent Universal Wood Worker. To show its range of work they make the following statement: "Among the other uses to which the machine can be applied we will mention chamfering, cornering of any description, rabbeting and jointing window blinds, gaining either straight or angular to any width or depth; panel raising on one or both sides with either square, bevel, ogee, cope or scotia raise; tenoning, ripping, cross-cutting, grooving, hand-matching, making glue joints and table joints, mitering, nosing, squaring up and a variety of other operations limited only by the skill and ingenuity of the operator. Although each operation demands a change of cutter and fence, this is easily managed by means of a movable bearing. The tables are so constructed that when lowered they also fall away from the cutter block, and all cutters in this, as in every other machine, are fitted on the spindles by a left-hand screw, so that the tendency is always to lighten up when the spindle is running. The two halves of the table can be adjusted at different heights to suit the operation in hand. The frame of the machine is in one piece; the spindle carrying the top cutter for the four-side molder and that for working the 22 different operations on the wood-working table are driven from the same pulley with two belts, and can be used separately or simultaneously. Of course, as in all machines of this class, skilled labor is indispensable in setting up the tools for each operation; but when that is complete and the appliances for insuring uniformity are adjusted, the accuracy of work is less dependent on the ability of the attendant than on the machine itself. The spur wheels on the feed rollers are adjustable to suit three depths of molding, being placed in each case over that part subjected to the deepest cut."

Another of the prominent features of their exhibit is their patent band saw, which is almost constantly in operation, attracting large crowds of curious spectators to watch the intricate and beautiful sawing done by it. This saw has a patent steel wheel, and has been designed so as to almost entirely prevent the breakage of saws, to economize power and increase production. An important feature in the saw is the method of keeping it at its proper tension, allowing at the same time some flexibility to the parts to compensate for any sudden impact and prevent breakage of the saws by buckling or friction on the back or sides. Their band resawing machine is constructed to take stuff 16 inches square, and blades up to 4 inches in width. The feed motion is very powerful and true, the rollers—four feed and four guide—being adjustable by levers attached to their sliding frames, operated by hand, lever, rack and pinion. The saw pulleys are 5 feet in diameter, and the arrangement of movable blocks with friction rollers fitted with lateral oil cups, lately improved and patented, reduces the chance of "buckling" to a minimum. The feed can be varied by means of friction rollers acting on a disk, according as the position of the former is nearer to or further from the center of the latter, from a speed of 5 feet to 35 feet per minute. The movable slide frames for adjusting the saw pulleys are fitted with rollers to reduce friction. Their power feed rod machine is of ex-







# Trade Report.

Office of THE IRON AGE,  
WEDNESDAY EVENING, July 17, 1878.

The past week has been uneventful in financial circles and very dull in the general markets. Money continues very easy and will probably continue so for some weeks. The rate to borrowers on call is 1 @ 2%. Business paper is quoted at 3 @ 4% for prime. Any mercantile paper not strictly "gilt-edged" is very difficult to negotiate.

The gold market has ceased to have much interest since the premium fluctuations have been confined to oscillations between 1/2 and 3/4. All quotations during the week have been at these figures.

Government bonds have been strong and active at higher prices. The popular subscription to the 4 per cents. continues large, and the process of their sale has enabled the Treasury Department to call \$5,000,000 more of 5-20 6 per cents. for redemption. State bonds are steady with the exception of Louisiana Consols, which are strong. Railway mortgages are strong, but somewhat irregular. We give below the quotations of governments.

The weekly statement of the New York banks shows a gain in the total reserve of \$3,578,600, made up of a gain of \$1,628,600 specie and \$1,950,000 legal tender notes. The surplus reserve is now \$23,252,025, against \$20,572,125 last week, and \$20,424,925 last year. The following is a comparison of the bank averages for the last two weeks:

	July 6.	July 13.	Differences.
Loans.....	\$236,516,000	\$234,120,100	Dec. \$2,395,900
Specie.....	80,490,000	82,048,600	Inc. 1,558,600
Legal tend'rs	53,666,300	55,556,600	Inc. 1,890,300
Deposits.....	213,676,700	217,411,100	Inc. 3,734,400
Circulation.....	19,829,900	19,572,100	Dec. 257,800

The foreign trade movements for the week are shown in the following tables:

## For week ended July 13:

	1876.	1877.	1878.
Total for week.....	\$5,371,584	\$6,704,395	\$4,115,046
Prev. reported.....	159,583,757	176,594,040	148,722,887

Since Jan. 1.....\$164,895,341 \$183,358,435 \$159,837,873

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils.....	76	\$740
Brass goods.....	6	2,430
Bronzes.....	10	1,360
Chains and anchors.....	27	120
Copper.....	120	35,308
Cutlery.....	101	35,308
Gun.....	13	1,454
Hardware.....	15	1,454
Iron ore, tons.....	59	9,024
Iron sheet, tons.....	72	91
Iron cr. tons.....	300	574
Iron, other, tons.....	319	5,572
Metal goods.....	113	13,039
Nails.....	30	80
Needles.....	20	4,624
Nickel.....	2	800
Platina.....	2	3,330
Per. caps.....	8	1,320
Saddlery.....	2	356
Steel.....	709	6,843
Silverware.....	2	36,370
Tin, boxes.....	148,100	148,100
Wire.....	353	4,110

## For week ended July 16:

	1876.	1877.	1878.
Total for week.....	\$5,296,661	\$6,154,447	\$5,413,092
Prev. reported.....	132,950,538	138,968,430	177,126,596

Since Jan. 1.....\$138,783,499 \$144,122,877 \$182,575,688

## For week ended July 13:

	1876.	1877.	1878.
Total for week.....	\$104,078	\$171,508	\$104,078
Previously reported.....	8,712,508	8,712,508	8,712,508

Total since Jan. 1, 1878.....\$8,814,580

Same time in 1877.....\$8,814,580

Same time in 1876.....\$8,814,580

Same time in 1875.....\$8,814,580

Same time in 1874.....\$8,814,580

Same time in 1873.....\$8,814,580

Same time in 1872.....\$8,814,580

Government bonds close as follows:

	Bid.	Asked.
U. S. Currency 6's.....	100 1/2	100 3/4
U. S. 6's 1881 registered.....	100 1/2	100 3/4
U. S. 6's 1881 coupon.....	100 1/2	100 3/4
U. S. 6's 1885 reg.....	100 1/2	100 3/4
U. S. 6's 1885 cou.....	100 1/2	100 3/4
U. S. 6's 1887 reg.....	100 1/2	100 3/4
U. S. 6's 1887 cou.....	100 1/2	100 3/4
U. S. 6's 1888 reg.....	100 1/2	100 3/4
U. S. 6's 1888 cou.....	100 1/2	100 3/4
U. S. 10-40 reg.....	100 1/2	100 3/4
U. S. 10-40 coupon.....	100 1/2	100 3/4
U. S. 4's 1881 registered.....	100 1/2	100 3/4
U. S. 4's 1881 coupon.....	100 1/2	100 3/4
U. S. 4's 1897 registered.....	100 1/2	100 3/4
U. S. 4's 1897 coupon.....	100 1/2	100 3/4

The following were the closing quotations of active shares:

	27 1/2	29
Atlantic and Pacific Telegraph.....	27 1/2	29
Chicago and Northwest.....	27 1/2	29
Chicago, Rock Island and Pacific.....	27 1/2	29
Chicago, Bur. and Quincy.....	27 1/2	29
Col. Chicago and Ind. Central.....	27 1/2	29
Clev. Col. and Ind. Ind.....	27 1/2	29
Cleveland and Pittsburgh.....	27 1/2	29
Chicago and Alton.....	27 1/2	29

	100	100 1/2
Canton.....	100	100 1/2
Delaware, Lack. and Western.....	100	100 1/2
Delaware and Hudson Canal.....	100	100 1/2
Express-Adams.....	100	100 1/2
" American.....	100	100 1/2
" United States.....	100	100 1/2
" Wells, Fargo & Co.....	100	100 1/2
Eric.....	100	100 1/2
Harlem.....	100	100 1/2
Hannibal and St. Joseph.....	100	100 1/2
Illinois Central.....	100	100 1/2
Kansas Pacific.....	100	100 1/2
Kansas and Texas.....	100	100 1/2
Lake Shore.....	100	100 1/2
Michigan Central.....	100	100 1/2
Morris and Essex.....	100	100 1/2
Milwaukee and St. Paul.....	100	100 1/2
New York Central.....	100	100 1/2
New Jersey Central.....	100	100 1/2
New Jersey Southern.....	100	100 1/2
Ohio and Mississippi.....	100	100 1/2
Pacific Mail.....	100	100 1/2
Panama.....	100	100 1/2
Pittsburgh and Fort Wayne.....	100	100 1/2
Quicksilver.....	100	100 1/2
St. L. and Iron Mountain.....	100	100 1/2
St. Louis Kansas City Northern.....	100	100 1/2
Toledo, Wabash & Western.....	100	100 1/2
Union Pacific.....	100	100 1/2
Western Union Telegraph.....	100	100 1/2

## GENERAL HARDWARE.

We hear of a slight improvement in the demand for goods, and some travelers who have started on their fall journey are being heard from with satisfactory memorandums considering the season.

The manufacturers of Brass Butts held a meeting at New Haven, Conn., yesterday, at which the price of these goods was advanced to discount 60 per cent.

The demand for Nails is seasonably fair. The condition of the market in the matter of prices is unchanged, and we quote as before: 10d to 60d, \$2.30, net, in a small way. For orders of 50 kegs and over this price would be shaded.

Mallory, Wheeler & Co. have just issued a revised price list of their Door Locks, Knobs, Pad Locks, &c., in which they illustrate and describe all the new goods added to their assortment since the publication of their 1876 catalogue. The condensed prices show some changes, among which we notice important reductions in their Alphabet Locks, the new list of which is as follows: No. A, \$1.75; D, \$2; E, \$1.25; F, \$1.50; G, \$1.25; H, \$1.50; J, \$1.75; K, 80 cents per dozen. We also notice that a number of Locks formerly made with the ordinary key are now furnished with the thin bit key. The discounts on all of their goods remain as before, Sargent & Co. are their agents in this city.

Hotchkiss' Sons, Bridgeport, Conn., have issued an illustrated catalogue in which they show a great variety of their new styles of Curry Combs. Their other specialties are also handsomely shown, among which are Mouse Traps, Game Traps, Carpet Stretchers, Ox Bow Pins, Bull Rings, Cattle Leaders, Breast Drills, Saw Sets, Bench Hooks, Spoke Shaves, Pruning Shears, &c.

The Shepard Hardware Company illustrate in their advertisement on the 3d page the Shepard Hand Fluter, which is a well-finished article at a very low price. They inform us that they have recently enlarged their facilities for the manufacture of these Fluters and they are now prepared to fill all orders intrusted to their care.

Hermann Boker & Co., Nos. 101 and 103 Duane street, have issued under date of 15th inst. a revised price list of R. Heinisch's Sons' Shears and Scissors, for which they are sole agents. We print below the complete lists of the R. Heinisch and R. H. S. brands. All the prices given are for Japanned handles, and for Nickel plated handles and blades a slight advance on the net price of Japanned is charged. They invite the attention of the trade to their new pattern Ladies' Scissors, in both R. Heinisch and R. H. S. grades. The regular trade discount is of R. Heinisch brands 50 per cent. and R. H. S. brand discount 65 per cent. An examination of the list and discounts shows important reductions in the R. Heinisch brand.

of the R. Heinisch and R. H. S. brands. All the prices given are for Japanised handles, and for Nickel plated handles and Nickel plated handles and blades a slight advance on the net price of Japanised is charged. They invite the attention of the trade to their new pattern Ladies' Scissors, in both R. Heinisch and R. H. S. grades. The regular trade discount is: off R. Heinisch brands 50 per cent. and R. H. S. brand discount 65 per cent. An examination of the list and discounts shows important reductions in the R. Heinisch brand.











## NORTH OF ENGLAND.

Mr. Waterhouse, the sworn accountant to the Northern Board of Arbitration and Conciliation, has just made his usual quarterly return, in which he sets forth the result of his examination of the manufacturer's books. Although the return shows a marked decline in the iron rail trade, the tonnage of plates turned out exceeds anything before known, being close upon 115,000 tons, against 98,000 tons in the preceding quarter. There is a considerable depreciation in the average net selling prices of iron for the quarter, the decline being 6/8 per ton.

## THE TRADES OF SHEFFIELD

are not largely altered, the end of the quarter being generally a dull period in the steel as well as in the ordinary iron trade. Just now people are particularly cautious. Sellers don't want to commit themselves lest trade should jump and prices go up, and buyers are something loth to enter into transactions which might overtop the market after the quarter days. The wire trade is, perhaps, as well employed as any, and is being steadily developed. One house at Sheffield produces over 20 tons weekly, chiefly for the French and German umbrella manufacturers. Steel wire of 13 gauge will bear a strain of 2300 pounds. Both Siemens and Bessemer steel are being rolled and drawn into wire—the former with encouraging success. The Bessemer mills are fairly busy, although at some of them old rail orders are being nearly worked off. At Brown, Bayley & Dixon's the cupola furnaces are now being heated by the waste gases from the converters, with such success that the consumption of coke in the cupolas is reduced to 1 1/2 cwt. per ton of pig iron melted. Under Mr. Holland's very able management this large concern is rapidly coming to the top of the local tree. In cutlery there is a very fair amount of business in hand, much of the common class being spear, matchet and butcher knives for Australia, Australasia and South America, while the best pocket and table knives continue to be sent to the States, India and Canada in very considerable quantities. The settlement of Cuban affairs has also induced a revived demand thence.

## STAFFORDSHIRE AND BIRMINGHAM.

In these districts—still exclusively devoted to ironmaking and even yet minus a single Bessemer converter—there is some speculation as to what may be the results of the forthcoming quarterly gatherings of the iron masters. Certain somewhat sanguine persons hold out the hope of a drop of 30/ per ton in list quotations for marked bars, which have for a long time been held at £8. 10/ and a corresponding reduction in sheets, hoops, angles and plates. This does not seem wholly probable, however, and a much more moderate estimate to count upon is a reduction of 10/ per ton. Even that has long been practically discounted, and to day marked iron can be had at £1 per ton lower than the official figures of the producers. What with one and another thing it is clear that South Staffordshire must look to its laurels. The furnaces there make good iron, it is true, but competition is gradually closing up all the old avenues, and steel is not the less surely driving all before it. The inland position of Staffordshire, however, is very disadvantageous for steel making, yet one would suppose this to be an evil capable of some mitigation, looking at what Sheffield, also inland, has done and is doing. In the hardware departments the smoothness of foreign and domestic politics and the splendid weather have combined to inspire dealers and consumers with greater confidence and hope than they have manifested for a long time past, so that there are many inquiries in the market that seem likely to lead up to the placing of orders. The Eastern markets are also coming forward and must of a certainty be large and good customers as soon as they shall have settled down once more into routine domesticity.

## SOUTH WALES AND MONMOUTHSHIRE.

From Cardiff last week the iron exports reached the improved total of 5007 tons, besides 100 tons of tin plate. From Newport 4772 tons of rails were shipped to foreign destinations. The Aakside Iron Company are supplying a quantity of machinery and some locomotives to India; they ship these to Kurrachee. The annual report of

## THE RHYMEY IRON COMPANY

is not a hopeful document. It says: "There has been a total loss on the twelve months' trading of £9626. The production of iron in the year amounted to 40,065 tons, and of steel to 7757 tons, against, in 1877, iron 47,700 tons, and steel 917 tons. For three-fourths of the year the works were kept in nearly full operation with orders for iron, but in the last quarter the demand was so small and the sale prices had fallen to so low a point that the directors considered it the most prudent policy to stop the working of the forges, and of the principal part of the mills. The course of the trade since their report of June, 1877, has been continuously unfavorable. The sale price of iron rails has fallen below £5 per ton, and the four years that have elapsed since the serious reaction that set in in 1874 are without parallel in the records of the trade, and have most severely taxed the resources of the manufacturer. In regard to the manufacture of steel, the new Bessemer plant was put into operation as reported in January last. Its power of production has proved satisfactory. It is capable of turning out about 1000 tons of steel ingots per week, equal to a weekly make of about 850 tons of steel rails, and this can be easily augmented with a comparatively small additional outlay. In reference to the trade in steel rails though the demand has exhibited a preference for that material over iron is extending, it has not been sufficient to maintain a proportionate difference in the price of the two materials, in the face of the large production of the numerous firms who have during the last few years embarked in the trade. Their competition for orders has forced the market price of steel rails down to £5 10/ per ton, a rate that has generally been considered low for iron rails."

## THE METAL MARKETS

have been tolerably steady on the week, and are not unlikely to grow stronger now that peace seems assured. The *Ironmonger* reports: "Copper closes fairly firm at £63. 10/

@ £64 for good ordinary Chili bars; £73. 10/ @ £74 for Wallaroo; £71. 10/ @ £71. 5/ Burra; £68. 5/ @ £68. 10/ English tough; and £75 @ £76 for good sheets. There is a considerable stock of Australian now in London, and large shipments are announced from Chili. Tin has become stiffer, on the whole, although at the close symptoms of weakness had manifested themselves. Australian and Straits run at about £62 @ £62. 5/; Banca, £64; English ingot, £65; bar, £66; and refined, £68. Tin plates are, if anything, a little firmer in price, owing to the commencement of the restricted production and to the receipt of favorable commissions from the United States. Prices are nevertheless not notably changed. Lead has been in slightly improved request, and is now firm at £17 for English pig; £17. 10/ W. B.; sheet and bar, £17. 15/; pipe £18 @ £18. 10/ and Spanish, £16. 7/6 @ £16. 10/ Quicksilver, Antimony, and Spelter unaltered."

The official report of the London Lombard Metal Exchange is: "Copper.—Firm; G. O. B. Chili bars, £63, spot, and about 300 tons for forward and arrival sold at £64. 10/ @ £65; Wallaroo, £73. 15/ @ £74; Burra, £71; English tough, £69 @ £70; best selected, £70. 10/ @ £71. 10/; strong sheets, £75. Tin.—Quiet at £62 @ £62. 5/ for Straits and Australian; English ingots, £65. 10/ @ £66. Iron.—Scotch pigs, 50/1 1/2 @ 50/2, cash. Lead.—Steady at £16. 17/6 @ £17. 2/6 for English pig; soft Spanish, without silver, £16. 12/6 @ £16. 15/ Spelter.—Business in ordinary brands, £17. 17/6, cash; £18 for forward delivery. Quicksilver.—£7 paid. Antimony.—£49 @ £49. 10/.

## INDUSTRIAL ITEMS.

## MAINE.

The Patten Car Works of Bath have just completed two handsome passenger coaches, a freight car and a baggage and smoking car for the Rumford Falls and Buckfield Railroad.

## NEW HAMPSHIRE.

J. Henry Lovell is fully occupied at his foundry and shop, Manchester, having the contract for the wrought and cast ironwork for the new State prison at Concord. S. C. Forsaith & Co., Manchester, report business better than last year. Some orders are now being filled for bolt-forging machines, and two of Palmers' power spring hammers have recently been shipped from their shops. This firm have a large trade in second-hand machinery, and their shipments South and West have been considerable of late.

Eaton & Ayer, of Nashua, manufacturers of bobbins, spools and shuttles, seem full of business and are filling numerous orders for the Hamilton patent cop shuttle. Over 50 corporations are reported as having adopted this shuttle, and its various points of merit are given in the firm's circular. A foreign order has recently been filled for 100,000 bobbins, and another for a like quantity is just received.

## MASSACHUSETTS.

O. Ames & Sons' shovel works at West Bridgewater are running five days in a week.

The Seymour Cutlery Company have recently received several foreign orders for their tailors' shears.

The Hampden Emery Company at Chester have six months' orders ahead and are to work on full time.

The Lamb Knitting Machine Company of Chicopee Falls have just made heavy shipments to Germany.

The Union Belt Company of Fall River, who shipped on request a sample of belting to Berlin, Prussia, about two months ago, have just received an order for 2000 feet.

The new machinery of the Hadley Thread Mill at Holyoke, which will increase the production of the mill 40 per cent., is now set up and will soon be in operation.

The Dover Stamping Company of Boston are setting a new steel boiler, 5 x 13 feet, built by Kendall & Roberts, Cambridgeport. It will be set with the Jarvis patent setting.

The Agawam Iron Company of Wareham have shipped during the past month over 300 tons of their tack plate. The increasing business necessitates their running part of the night.

The foundations are being laid at South Abington for a large building in which the Hendry Patent Axle Company are to carry on a heavy business in the manufacture of their specialty. The location is near the tack works of Brigham, Litchfield & Vining, who are proprietors of the Hendry patent.

## CONNECTICUT.

Colt's Company, at Hartford, are now engaged in manufacturing a double action 45 caliber revolver for the English market. This is a favorite arm with Englishmen. The Gatling gun is being improved at the suggestion of French experts.

## NEW YORK.

A contract for furnishing complete two of the flouring mills recently destroyed at Minneapolis, Minn., has been awarded to the firm of John T. Noye & Son, of Buffalo.

Sidney Shepard & Co., tinware manufacturers, Buffalo, report their trade quite as large as last season, but with smaller margins. At the manufactory they are running full time, employing 300 men.

Messrs. Swett, Quimby & Perry molded and cast last week for the Bessemer steel works an anvil block that weighed over 20 tons. The Empire is the only foundry in this city that has capacity for casting so large a piece of iron as this. A few years since Swett, Quimby & Perry cast a 27-ton block for the Messrs. Burden, which was the heaviest casting ever made in Troy.

Messrs. Copeland & Bacon of New York are using the patent "bracket pattern" steam pump, made by John McGowan & Co. of Cincinnati in connection with their steam-power hoisting machinery.

Burdett, Smith & Co.'s foundry at Troy, which has not been running since July 4, will resume operations the early part of next week.

The scythe works at Ballston last year manufactured 163,000 scythes and 2400 sickles—an unusually large showing for the year.

## PENNSYLVANIA.

A. Whitney & Sons' car-wheel works in Philadelphia cover 80,000 square feet.

Moller & Co., Reading, have commenced the manufacture of turbine water wheels invented in Canada.

The Diamond Drill Company of Pottsville have sent three of their drills to Victoria, Australia, and the men to work them.

The Roberts Machine Shop, Titusville, has made five engines in order for Southern customers to be used in operating cotton gins.

The Conestoga Lock Works, Lancaster, are running full force and full time on Scandinavian jail or pad locks.

The new horse-shoe factory of the Cambria Iron Company, Johnstown, will soon be ready to go into operation, the necessary machinery having arrived.

The steam engine and boiler works at Waynesboro, Franklin county, are still running to their full capacity. Over 100 workmen are employed daily at 11 hours per day.

For the week ending at midnight on Saturday, 348 tons of iron were manufactured at the furnace of the Warwick Iron Company, at Pottstown. This number exceeds by three tons the largest yield of the Warwick Furnace in any previous week.

The Bloom Furnaces, Wm. Neal & Sons, proprietors, "chilled" and went out of blast on Wednesday the 10th inst. We understand they are cleaning out as rapidly as possible and expect to blow in again within a month.

An attempt to cool off the blast furnace at the establishment of Stephen Robbins & Sons, Philadelphia, last Wednesday, resulted in badly scalding a number of employees. John McChesney, superintendent, cannot survive, and John Russell, Patrick Walters, Patrick Connors, Harry Ennis, John Gallagher and Hugh Keefe are among the seriously injured.

The first published report of the operations of the beneficial fund of the Philadelphia and Reading Coal and Iron Company, detailing the receipts and disbursements to the employees of the company at the collieries owned and operated by them, states that the receipts were \$2050.90, and the disbursements on account of injuries received by the members were \$1082.21. A balance of \$1368.74 remains to the credit of the fund.

A. F. Bordon, foreman of E. and G. Brooke's nail factory at Birdsboro, has designed and put in operation on several machines an "improved feed," which is destined in a great measure to supersede the old style. By its use a number of bolts are dispensed with, and the "nipper rod" or "feed" proper is constructed on the swivel principle, which, when a premature grip occurs, allows the rod to turn, thus preventing straining the springs on the "barrel" or springing the gauge. Mr. Bordon has a patent now pending, having already secured a caveat.—*Cor. of Reading Eagle.*

We clip the following from the *Sharon Herald* of the 12th inst.: At the New Mill, same as last week; guide mill, double turn; nail plate mill and nail factory, single turn. At the Old Mill (Western Iron Company) up till Wednesday night turn, puddle and guide mills, double turn; hoop, bar and sheet mills, single turn; nail plate and nail factory off. All remained off until Monday of the present week, when all went on again. No signs of starting the Middlesex Mill. From Sharpsville down to Middlesex, including both places, there are six blast furnaces in and fifteen out; but the ins are doing as well as can be expected.

## PITTSBURGH AND VICINITY.

Messrs. Curry, Mays & Co. will erect a foundry and machine shop at McKeesport.

Messrs. Mitchell, Stephenson & Co., of Pittsburgh, started up their stove foundry on Wednesday the 10th inst.

The old glass factory, formerly managed by Plunkett & Ward, on the South Side, will be started up in a few days, under the new firm of Plunkett, Ihmsen & Co. Glass lamp chimneys will be manufactured.

The creditors of Reese, Graff & Woods failed to hold a meeting on Wednesday of last week, according to arrangement, and did not come together yesterday, as expected, with a view of deciding upon accepting or rejecting the proposition submitted by the firm.

A pretty large force of men have been discharged from the Keystone Bridge Works, the company having put to work a hydraulic machine for riveting, which takes the place of hand work. Last Saturday evening 20 men were temporarily discharged from the locomotive works of Porter, Bell & Co.

Some days since the announcement was made that the National Tube Company, of McKeesport, contemplated the erection of a new rolling mill at that place. The *McKeesport Times*, says: But little has been heard of late of the proposed new rolling mill to be erected by the National Tube Works Company of this place. Although nothing definite has been done as yet in regard to selecting a site, we have it upon pretty good authority that the machinery for the mill is now under way, some of it in the East, some of it in the city and some at the company's works in this place. It is not probable anything will be done before September in regard to the location of the mill, and it is presumable that rather than be "gouged" in the purchase of a site, some other place than this will be agreed upon by the company. The National Company never does things by halves, and it is a settled fact that wherever the mill is put it will be a good one. Should it be McKeesport's good fortune to have it located within its limits, it just means employment for several hundred more men.

Marshall Bros., Pittsburgh, have just received the contract from W. H. Henry, of Akron, Ohio, for two steam engines and a patent passenger elevator for his new store, after a lively competition with Buffalo, Cincinnati and New York firms. The same firm have obtained the contract for supplying the Rochester Tumbler Works and the Stamm House, Wheeling, with patent elevators.

The glass works of Doyle & Co., on the South Side were destroyed by fire last Monday night. While the walls of the building are not badly injured the woodwork is totally consumed. There was a considerable amount of stock in the packing room, none of which was saved. The loss is estimated by Mr. William Doyle, a member of the firm, at from \$3000 to \$10,000, which is fully covered by insurance.

## WEST VIRGINIA.

Work was resumed at the Aetna Mills, Wheeling, double turn last Friday.

The forge department of the Benwood Mill, Wheeling, resumed work on last Saturday.

The La Belle Glass Works will start up the latter part of the month.

The Wheeling Hinge Company made more goods during the six months ending July 1 than in any previous six months in the history of the factory. Their product was \$84,855 and their sales \$68,494. In the first six months of 1877 the product was \$75,754 and their sales \$71,809. In common with the iron interests generally of the city no profit worth mentioning was made.

## OHIO.

The Hubbard Rolling Mill started Tuesday morning, the 9th inst., after an idleness of several weeks.

Cincinnati has one of the largest stove foundries in the United States—that of Davis & Co., occupying the entire space from Third to Webb and John to Smith streets.

Burke, McCole & Co. have lately set up at Portsmouth a wooden stirrup factory, which turns out from 500 to 600 dozen per week, all the work being done by machinery and in a manner lately patented by M. T. Burke, one of the firm, the block holding together the ends being replaced by an iron clamp, which at the same time prevents splitting of the wood.

The Mingo Furnace directors held a meeting at the works last week and made an assignment of all their personality to George A. Dean for the benefit of their creditors. This personality consists of a small amount of iron and other material, and also wagons, horses, tools, &c. The statement showed \$285,000 indebtedness, and nominal assets to within \$1500 of that amount. These nominal assets consist of the cost price for the two furnaces, tenement houses, coal shaft, &c., represented on the books at their cost, but really worth very much less to-day. The supposed present value of the assets will leave an excess of liabilities of, say, \$200,000. The liabilities consist of \$67,500 first mortgages, \$62,500 seconds, and \$155,000 of floating debt, making \$285,000. The largest creditor is the firm of Nimick & Co., Pittsburgh, some \$22,000. D. Megary & Co., of the coal and coke works at Steubenville, are also creditors to the extent of some \$17,000.

Messrs. John McGowan & Co., of Cincinnati, have just shipped five of their new "Rival" steam "Bracket Pattern" Pumps to Mansfield, O.; two of the same to Owens, Lane & Dyer, Hamilton, O., and have sold quite a number to other parties, including one now in successful operation at the Lyons brewery, pumping condensed steam and utilizing the same. This pump is giving full satisfaction and is highly appreciated.

Messrs. Lane & Bodley, engine builders and machinists, of Cincinnati, have recently shipped one of their hub-mortising machines to Manchester, England. They have shipped a number of these machines to European and other foreign parts during the year. They have also just shipped one of their engines and boilers with John McGowan & Co.'s new steam pump attached, and are preparing several others for shipment with this new pumping attachment.

## MISSOURI.

The Hamilton Furnace property at Sullivan, including 7000 acres of land, was sold recently under a foreclosure of mortgage. The mortgage was for \$20,000, but the property sold for \$11,500. The land is valuable only for the timber upon it, which can be used in making charcoal for operating the furnaces.

## INDIANA.

The Indianapolis Rolling Mill Company are considering the question of converting their works into a steel rail rolling mill. The success of the Chattanooga mill and the prospect for a constantly increasing demand for steel rails, to relay the roads now in existence as the iron rails wear out and to supply the new roads which will be built, are points which are considered favorable to the change.

## ILLINOIS.

The Elgin Watch Factory is at present running steadily with a force of about 750 hands, and turning out from 300 to 350 finished watches per day.

Bonnet, Duffy & Co., stove manufacturers, of Quincy, up to May 23 had run continuously for fifteen weeks without losing a heat. They will turn out more stoves this year than in any previous year. They employ a force of from 75 to 80 men.

## KENTUCKY.

The Norton Iron Works rolling mill and nail factory quit work on the evening of the 3d inst. and continued off until Monday, the 8th, when all departments went to work again and are now in full blast.

Mr. Lantz, formerly of the McKeesport (Pa.) Locomotive Works, has recently built for a street car line running between Newport and Dayton, Ky., a dummy engine and car, which combine in the construction of their machinery some new and novel improvements, and embrace one of the new "Bracket Pattern" pumps now being made by Messrs. John McGowan & Co., of Cincinnati.

## MICHIGAN.

As an illustration of the difference between then and now, we will say that late in the fall of 1872 the Lake Superior Iron Company found itself compelled to charter an extra vessel to carry a cargo of ore from Marquette to Cleveland, as the boats running for the company could not get all the ore to market. For the transportation of this cargo the company paid \$6.50 per ton, 50 cents more than the best quality of hard ore can be sold for at Cleveland to-day.—*Mining Journal.*

The following, from the *Marquette Mining Journal*, is a statement of the lake shipments of ore and pig metal in gross tons for the season up to and including Wednesday, July 10:

## FROM MARQUETTE.

Rolling Mill.....	9,300	Cleveland.....	36,820
Lake Superior.....	42,399	Humboldt.....	7,338
Mitchell.....	83	McComber.....	4,368
Edwards.....	4,707	Marquette.....	1,648
Republic.....	90,052	Winthrop.....	1,540
Champion.....	22,756		
Keystone.....	1,674	Total.....	224,225

FROM L'ANNE.	
Michigan.....	13,988
Stewart.....	1,130
Total.....	15,018

## FROM ESCANABA.

Jackson.....	25,443	Mitchell.....	106
South Jackson.....	4,819	Cambria.....	1,118
New York.....	9,667	Goodrich.....	3,290
Cleveland.....	1,337	Bessemer.....	3,977
Angeline (hard).....	12,771	Smith.....	4,597
" (hematite).....	1,393	Vulcan.....	18,841
Barnum.....	9,082	Quinnesec.....	9,860
Saginaw.....	34,405	Breen.....	680
Salsbury.....	19,165	Cleveland (hem'ite).....	2,359
Palmer.....	4,619	Pendill.....	1,170
Michigan.....	7,292	Howe.....	791
Superior (hard).....	5,964	N. York (hematite).....	1,495
Emmett.....	3,076		
McComber.....	1,337	Total.....	179,896
Winthrop.....	1,419		

## Pig Iron.

Carp River Furnace.....	1,768
Pioneer Furnace.....	380
Total.....	2,148

## Quartz.

Carp River Iron Co.....	199
-------------------------	-----

## French Views of American Competition with Great Britain.

In the report of the Committee of Inquiry appointed by the French Senate to inquire into the causes of the present industrial depression in that and other countries, we find the following:

The prolonged crisis in Europe has been the result of an excess of production over consumption, which excess in its turn has been brought about by the great industrial expansion in England and on the Continent subsequent to the war of 1870-71. On the other hand, the United States has closed her markets; under the cover of protection she has reared a most powerful industry, which in nearly every article begins to compete with the manufactures of England and Europe the world over. This is, in fact, an economical revolution which baffles all calculation. We need but read the English newspapers, the English consular reports received from the United States and those of the British chambers of commerce, in order to at once fully appreciate the excitement which exists on the subject in Great Britain. England was fully equipped with the necessary machinery for stocking the world with its manufactures. The English were sanguine enough to hope that the world's raw produce would flow into their country from all quarters, to be returned in the manufactured state from their great workshops. In order to carry out this problem they had the vessels to bring the cotton, the ores, wool, &c., and would return them laden. They had the cheapest coal and iron. England's spindles, looms and workshops were countless in number, and they are so still. When Cobden had made free traders out of his countrymen who had been clinging to protection for centuries, he did so animated by some such gigantic project, and England may well erect statues to do him honor. But could Cobden foresee that the day would come when the Americans would resolve upon spinning and weaving their own cotton instead of shipping it to England to be converted into manufactures? Could he have foreseen that the Americans would at some future day close their markets, and having iron, coal, cotton and other raw material all on the spot, build manufactures by the thousand? Had he any conception of the possibility of the Americans one day possessing cotton mills with 400,000 spindles and 3500 looms in a single factory, as they may be met with at Lowell; that one machine shop would turn out 450 locomotives in a single year; in other words, that this new manufacturing country would become the rival of England, send its cotton goods to Manchester and watches to Geneva? England, after reaping great advantages from the new politico-economical system inaugurated by her, has now found her rivals in the Americans, in her own subjects in India and, in the metallurgical branch, in Germany.

**Nailmakers' Strike in England.**—LONDON, July 16.—The nail makers, to the number of 10,000, in the Old Hill, Dudley, Rowley and Hale's Owen districts have struck for an advance of 30 per cent. in their wages. Ten thousand more will join the strike by the end of the week.

President Gowen does not seem to be very popular with the Thugs of the anthracite district, which is not to be wondered at. The *Sunbury American* says: Monday evening the little "Gem," a small engine used on the Philadelphia and Reading Railroad for conveying the officers from point to point on that road, arrived here in advance of the excursion carrying some of the officers of the road. About 10 o'clock it started back to Shamokin carrying Superintendent Olhausen, Captain Alderson, Paymaster Jones and others to Shamokin. When the party arrived at the switch this side of Cameron Colliery they found, when too late, that it had been turned, and the "Gem" ran off the track and was considerably wrecked. As soon as it got off the track a party lying in ambush commenced stoning the party, and injured the fireman seriously. The party supposed, no doubt, that President Frank Gowen was on the train, as they have made repeated threats of vengeance. The switch was turned for the purpose of wrecking the engine, as no train had passed over it after examination by the watchman after the last train passed over the road in the evening.

Mr. Homer Morgan, the veteran real estate owner, remarked last evening that he was amazed on observing the number of fine dwellings in progress in the best parts of the city. Very many, he said, are improving property which they have long held vacant, in anticipation of better times coming, but judging from his experience in 1857, we must expect fluctuations in value for a year or more before settling down on a substantial basis.

We learn that the steamer John Bramhall is detained at New Haven with her cargo of \$2,000,000 in fire-arms and ammunition, awaiting advices from Constantinople relative to insurance.



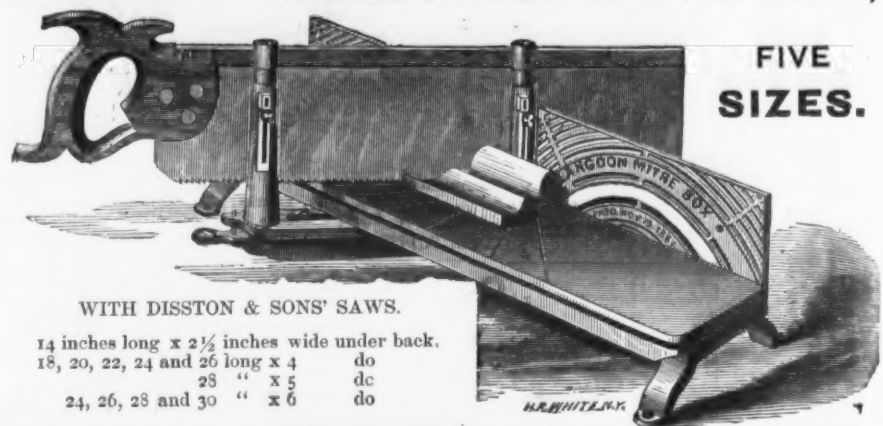
# THE LANGDON MITRE BOX COMPANY,

Millers Falls, Mass.,



Sole Owners and Manufacturers of the  
**LANGDON ADJUSTABLE MITRE BOX,**

**FIVE SIZES.**



WITH DISSTON & SONS' SAWS.

14 inches long x 2 1/2 inches wide under back.  
18, 20, 22, 24 and 26 long x 4 do  
23 " x 5 dc  
24, 26, 28 and 30 " x 6 do

All parts of each size, made to interchange. Illustrated circulars (issue 1877) sent when desired.

Dealers wishing to advertise furnished with electrotypes without cost.

# L. COES' Genuine Improved Patent SCREW WRENCHES.

Manufactured by

**L. COES & CO.,**  
Worcester, Mass.

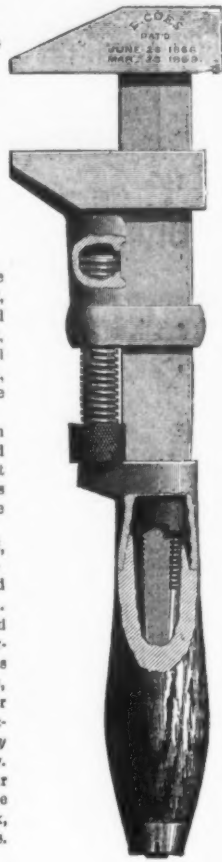
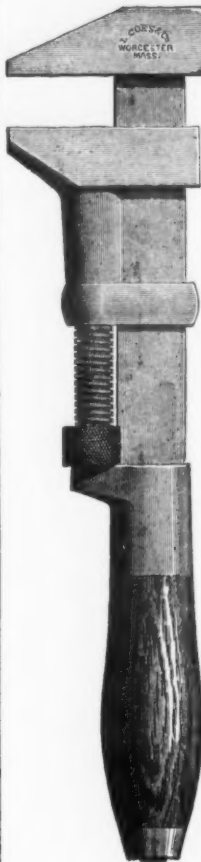


We invite the particular attention of the trade to our New Straight Bar Wrench, welded, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the Genuine Wrench by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped;

**"L. COES & CO."**



Warehouse, 97 Chambers St., & 81 Reade St., N. Y.  
**HORACE DURRIE & CO.,** Sole Agents.

# EXCELSIOR WRINGERS

The only Wringers that conduct the water into either

tub, without being changed from one

tub to the other.



They wring from either tub into the other, right or left, with equal facility. Warranted to work as represented.

**FOR STATIONARY TUBS.**

They are made for use on square tubs, such as are principally used in cities, and are the only Wringers especially adapted for that purpose. Send for an illustrated price list to the manufacturers.

**BAILEY WRINGING MACHINE CO.,**  
No. 99 Chambers Street, New York.

ALSO MANUFACTURERS' AGENTS FOR

Defiance Metallic Planes, Simpson's Adjustable Vises, American Meat Choppers, Silver's Stuffers and Presses, Domestic Ironing Mangles.  
**SPECIAL QUOTATIONS ON THE ABOVE GOODS FOR EXPORT.**



With our present large variety and constant additions of new Patterns, we are enabled for the Season of 1878 to meet the requirements of all. To the Dealer who is desirous to secure the Best Stoves in the market, we would solicit he correspond with us and order Samples which we will guarantee to fully meet all recommendations.

We manufacture Stoves for burning all kinds of fuel.  
**THE GARLAND BASE BURNER,**

Acknowledged Favorite, will appear for season of 1878 with entire changes, which can't fail to make it the Leading Base Burner.

Send for descriptive catalogue, price list, &c.

# G. W. Bradley's Edge Tools.

Butchers' Cleavers,  
Butchers' Choppers,  
Axes and Hatchets,  
Grub Hoe and Mattocks  
Mill Picks  
Box Chisels and Scrapers

Ring Bush Hooks  
Axe Eye Bush Hooks,  
Socket Bush Hooks,  
Watt's Ship Carpenters' Tools,  
Carpenters' Draw'ing Knives,  
Coopers' and Turpentine Tools.

FOR SALE BY

**MARTIN DOSCHER, Agent, 96 Chambers Street, N. Y.**

# NATIONAL Horse Nail Co.

MANUFACTURERS OF

**FINISHED**

(BRIGHT OR BLUED)



These nails are made of the best brands of **NORWAY IRON**, and are guaranteed to be equal to any in the market.

**NATIONAL HORSE NAIL CO.,**

VERGENNES, VT.

**HORACE DURRIE & CO., Agents,**

No. 97 Chambers St., New York

**CHAS. E. LITTLE, 59 Fulton St., N. Y.**



**Solid Cast Steel Augers & Reamers**

For Boring PUMP LOGS. All sizes in stock. Socket Shanks, Ring Handles, and Connecting Rods for the above to order. Also Tensioning Tools for joining log ends. Coopers' and Slaters' Tools. Tool Chests. Tools for all trades a specialty.

**PUTNAM'S**  
HOT FORGED & HAMMER POINTED  
Horse Shoe Nails.



TRADE MARK.  
Made from the best of Norway Iron.  
The only hot forged machine made Horse Shoe Nail in the world that is not sheared or cut on the point. Warranted never to split or silver in the driving, and to hold the shoe longer than any other Nail. For sale by the hardware and iron trade generally.

**PUTNAM NAIL CO.,**  
P. O. Address, Neponset, Mass. **BOSTON**

**PATENT CONVEX**  
Fluting & Smoothing Iron.



1st. It can be used as an ordinary Smoothing Iron. 2d. It is a Fluting Machine as well as a Smoothing Iron. 3d. The Fluting Attachment being made of brass, and convex in form, it has all the advantages of the crank machine. 4th. It combines the two articles in one, taking up the room of but one machine, and is always ready for use.

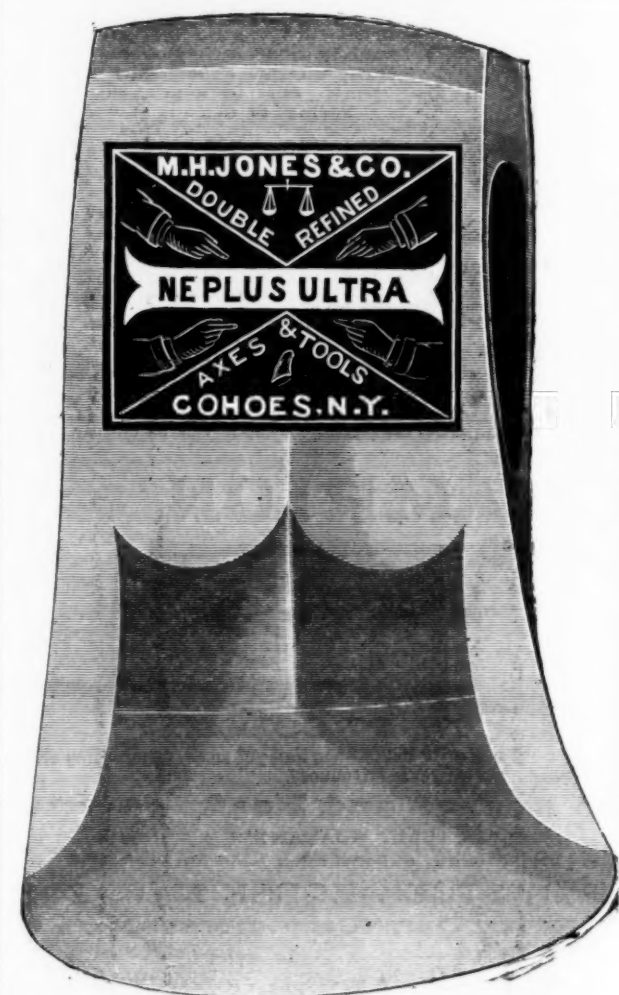
**A. A. WEEKS, Manufacturer,**  
No. 82 John Street, New York.

# TACKLE BLOCKS

**BURR & CO.,**

Manufacturers of Waterman and Russell's  
**Patent Iron Strapped Blocks.**

Also, Manufacturers of  
**ROPE STRAPPED BLOCKS.**  
31 Peck Slip, New York.



**HORACE DURRIE & CO.,**  
Agents, - - - New York.



**WM. HASSALL,**  
Manufacturer of  
American and French  
**Wire Nails**

With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. Brush Makers', Upholsterers', Cigar Box, Basket, Chair and Undertakers' Finishing Nails a specialty. Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheon Pins, with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: Nos. 63 & 65 Elizabeth Street, New York.

**CHAMPION**  
HOC RINGER  
RINGS and HOLDER.



**EAGLE BILL**  
CORN HUSKER  
is the best Husker in the market. Farmers say it is the best. Use no other.



**BROWN'S**  
HOC AND PIG  
RINGER and RINGS  
Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Ringers, 75c. Rings, 50c. 10c. Holders, 75c. Huskers, 15c.  
**CHAMBERS BEHING & QUINLAN, Exclusive Manufacturers Decatur, Ill.**







# The Iron Age Directory

and Index to Advertisements.

## Agricultural Implements.

Hubbard H. N., 333 E. 2nd, N. Y. .... 28

## Air Compressors.

Clayton James, 11 Water, Brooklyn, N. Y. .... 12

## Alarm Hoses, Drainers.

Tucker & Dorsey, Indianapolis, Ind. .... 18

## Anti-Friction Metals.

Reeves Paul S., Philadelphia, Pa. .... 42

## Anvils, Manufacturers of.

Fisher & Noville, New York, N. Y. .... 28

## Asbestos, Manufacturers of.

Richardson Mfg. Co., Worcester, Mass. .... 12

## Armors, Plates.

Moorhead & Co., Pittsburgh, Pa. .... 4

## Augers, Bits, etc., Manufacturers of.

Clark Wm. C., Erie, Pa. .... 13

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

## Augers, Bits, etc., Manufacturers of.

Harlow C. C. & Co., Bridgeport, Mass. .... 28

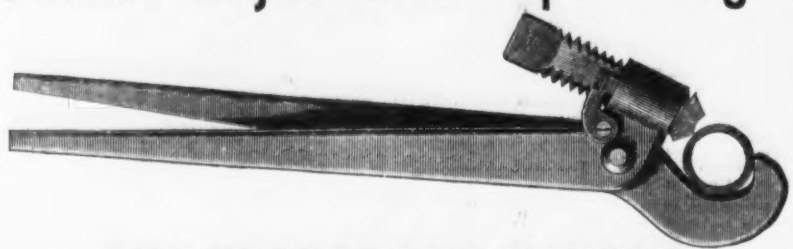
**Export Factors.**  
Jennings S. H., Deep River, Conn. .... 20  
**Faucets, Brass, Manufacturers of.**  
McNab & Harlin Mfg. Co., 56 John, N. Y. .... 28  
**Faucets, Wood.**  
Penfield Block Works, Lockport, N. Y. .... 39  
**Faucets, Self-Measuring, Manufacturers of.**  
Enterprise Mfg. Co., of Pa., Phila. and N. Y. .... 36  
**Felt.**  
Crane & Chapin, 31 & 33 Courtlandt, N. Y. .... 19  
**Files, Importers of.**  
Carr J. & Riley, 82 John, N. Y. .... 34  
Fisher Joseph S., 411 Commerce, Phila. .... 11  
Frasse Petrus B., 40 Fulton, N. Y. .... 34  
Moss F. W., 50 John, N. Y. .... 34  
Sanderson Bros. & Co., 16 Cliff, N. Y. .... 34  
**Files, Manufacturers of.**  
American File Co., Pawtucket, R. I. .... 8  
Auburn File Works, 45 Chambers, N. Y. .... 8  
Barnett G. & H., 41 and 43 Richmond, Phila. .... 8  
Chalmers & Murray, 70 Reade, N. Y. .... 8  
Diston Henry & Sons, Phila. .... 8  
Draper C. T. & Co., Sing Sing, N. Y. .... 8  
Heller & Bros., Newark, N. J. .... 8  
Johnson & Bro., 1 Commercial, Newark, N. J. .... 8  
John & Bro., 172 and 174 N. 4th, Phila. .... 8  
Paul Chas. B., Williamsburg, N. Y. .... 8  
**Fire Brick, Manufacturers of.**  
Borgner & O'Brien, Philadelphia, Pa. .... 19  
Brooklyn Clay Refractory and Fire Brick Works, Van Dyke St., Brooklyn, N. Y. .... 19  
Gardner, Stuart & Co., Pittsburgh, Pa. .... 19  
Hall A. & Sons, Perth Amboy, N. J. .... 19  
Hill & Sons, Buffalo, N. Y. .... 19  
Maurer Henry, 418 East 2d, N. Y. .... 19  
Kreischer R. & Son, 28 Goerck, N. Y. .... 19  
Ostrander James & Son, Troy, N. Y. .... 19  
Valentine M. & Co., Woodbridge, N. J. .... 19  
Watson John B., Perth Amboy, N. J. .... 19  
Weber Adam, 635 E. 15th, N. Y. .... 19  
**Flint and Emery Paper and Cloth.**  
Baeder, Adamson & Co., 730 Market, Phila. .... 34  
**Flower Pot Stands.**  
Barnum E., Detroit, Mich. .... 34  
**Fluting Irons.**  
Burger & Baumgard, 98 Duane, N. Y. .... 13  
**Fluting Machines.**  
The American Machine Co., Philadelphia, Pa. .... 35  
Weeks A. & Co., 52 John, N. Y. .... 35  
**Forges, Portable, &c.**  
Keystone Portable Forge Co., Philadelphia, Pa. .... 40  
**Fossiliferous Ores.**  
Brown T. J., Rockwood, Tenn. .... 6  
**Foundry, Manufacturers of.**  
Paxson J. W. & Co., 514 Beach, Phila. .... 5  
Whitehead Bros., 517 W. 15th, N. Y. .... 5  
**Furnaces, Manufacturers of.**  
Richmond & Potts, 119 S. Fourth, Phila., Pa. .... 5  
**Gas, Manufacturers of.**  
Carey & Moen, 234 W. 20th, N. Y. .... 2  
Haigh Lloyd J., 81 John, N. Y. .... 2  
**Galvanized Iron.**  
Lefebvre Marshall, Jr., 90 Beekman, N. Y. .... 3  
**Grain Cradles.**  
Grant Fan Mill and Cradle Co., Melrose, Rensselaer Co., N. Y. .... 3  
**Grindstones.**  
Wilson & Hughes Stone Co., Cleveland, O. .... 35  
Wood H. S. & Co., 38 West, N. Y. .... 35  
Wood Walter R., 203 and 205 Front, N. Y. .... 35  
Worthington & Sons, North Amherst, O. .... 35  
**Guns, &c.**  
Windmiller Louis & Roelker, 20 Reade, N. Y. .... 20  
**Gunpowder, Manufacturers of.**  
Kneeland F. L. (DuPont) 70 Wall, N. Y. .... 34  
Ruffin & Rand Powder Co., New York, N. Y. .... 34  
**Hardware Commission Merchants.**  
Biglin Philip S., 100 Chambers, N. Y. .... 9  
Graham & Haines, 113 Chambers, N. Y. .... 9  
Holmes, Booth & Sons, 100 John, N. Y. .... 9  
Manhattan Brass Co., 83 Reade, N. Y. .... 9  
Miller Edw. & Co., 35 Warren, N. Y. .... 9  
Plume & Atwood, 82 Co., 80 Chambers, N. Y. .... 9  
Scovill Mfg. Co., 42 Broome, N. Y. .... 9  
Waterbury Brass Co., 256 Broadway, N. Y. .... 9  
**Hardware Foundries.**  
Beever Paul, Philadelphia, Pa. .... 42  
**Bridge Builders.**  
Moseley Iron Bridge and Roof Co., 5 Day, N. Y. .... 4  
**Buck Saws.**  
Boynton E. M., 80 Beekman, N. Y. .... 42  
**Butcher and Shoe Knives, Manufacturers of.**  
Wilson John, Sheffield, England. .... 35  
**Butte and Hinge.**  
American Spiral Spring Butt Co., 2 Beekman, N. Y. .... 42  
Sabin Mfg. Co., Montpelier, Vt. .... 27  
Sempie & Birge, 100 Chambers, N. Y. .... 4  
Steel Works, New Britain, Conn. .... 6  
Union Mfg. Co., 98 Chambers, N. Y. .... 28  
**Calipers.**  
Victor Sewing Machine Co., Middletown, Conn. .... 2  
**Carriage Bolts, Manufacturers of.**  
Forsand, Wilson & Hall, Philadelphia, Pa. .... 12  
**Carriage Hardware, Manufacturers of.**  
Hayden & Smith, Auburn, N. Y. .... 12  
Sempie & Birge, 100 Chambers, N. Y. .... 4  
Steel Works, New Britain, Conn. .... 6  
**Carriage Springs.**  
Rome Trestle Co. (Limited), Rome, N. Y. .... 12  
**Car Axles.**  
Robert A. & P. & Co., 25 S. 4th, Philadelphia, Pa. .... 4  
**Chains.**  
Reiter & Norton, Pittsburgh, Pa. .... 6  
**Chilled Rolls (Hollow).**  
Totten & Co., Fulton Foundry, Pittsburgh, Pa. .... 6  
**Chisels, Manufacturers of.**  
Buck Bros., Milbury, Mass. .... 11  
**Civil Engineers.**  
Whinery S., Chattanooga, Tenn. .... 6  
**Clocks, Springs, &c., Manufacturers of.**  
Cary & Moen, 234 W. 20th, N. Y. .... 2  
Dunbar Bros., Bristol, Conn. .... 35  
**Clothes Pins (Metallic).**  
Broder J. I. & Son, 285 Greenwich, N. Y. .... 26  
**Coal, Miners of.**  
Pardee A. & Co., 111 Broadway, N. Y. .... 35  
Tennessee Coal & Railroad Co., Tracey City, Tenn. .... 35  
The Hoboken Coal Co., Jersey City, N. J. .... 35  
**Coal Vases.**  
Sidney Shepard & Co., Buffalo, N. Y. .... 31  
**Coffee and Tea, Manufacturers of.**  
Lane Brothers, Milbrook, N. Y. .... 18  
**Compasses and Dividers, Manufacturers of.**  
Bemis & Co., Hartford, Conn. .... 3  
**Coopers' Tools, &c., Dealers in.**  
D. R. Barton Tool Co., Rochester, N. Y. .... 13  
Little Chas. E., 59 Fulton, N. Y. .... 25  
**Copper.**  
Pope, Cole & Co., Baltimore, Md. .... 2  
The New Haven Copper Co., 255 Pearl, N. Y. .... 2  
**Corn Huskers.**  
Chambers, Bering & Quinlan, Decatur, Ill. .... 25  
**Corrugated Iron.**  
Moseley Iron Bridge and Roof Co., 5 Day, N. Y. .... 4  
**Crucibles, Manufacturers of.**  
Wile, Siegel & Co., 70 Market, Phila. .... 37  
**Cupolas & Blowers.**  
Smith & Sayre Mfg. Co., 21 Courtlandt St., N. Y. .... 40  
**Curry Combs, Manufacturers of.**  
Hazelton D. W. & Co., Philadelphia, Pa. .... 37  
Hotchkiss Sons, Bridgeport, Conn. .... 37  
Lawrence Curry Comb Co., 382 2d av., N. Y. .... 37  
**Cutlery, Importers of.**  
Boker Hermann & Co., 101 Duane, N. Y. .... 38  
Clatworthy F. & W., 82 Chambers, N. Y. .... 38  
Fisher Jos. S., 411 Commerce, Phila. .... 11  
Friedmann & Latorjung, 14 Warren, N. Y. .... 11  
**Cutlery, Manufacturers of.**  
Burkhardt Aaron, Peppercell, Mass. .... 11  
Goodell Company, Andover, N. H. .... 11  
Meriden Cutlery Co., 43 Chambers, N. Y. .... 11  
Nauvau Cutlery Co., 50 Chambers, N. Y. .... 11  
New York Knife Co., Walden, N. Y. .... 11  
The Fray Cutlery Co., Bridgeport, Conn. .... 11  
The Lamson & Goodnow Mfg. Co., 88 Chambers, N. Y. .... 11  
**Differential Pulley Blocks.**  
Yale Lock Mfg. Co., 53 Chambers, N. Y. .... 7  
**Dinner Pail & Lanterns.**  
Haigh, Jos. Cortes, N. Y. .... 11  
**Discount Tables.**  
Jennings S. H., Deep River, Conn. .... 20  
**Dog Muzzles.**  
Mersereau W. T. & J., 321 Broadway, N. Y. .... 12  
**Door and Gate Springs.**  
Duane F. R., 125 Fulton, N. Y. .... 34  
Quackenbush, Townsend & Co., 50 Reade, N. Y. .... 34  
Van Wagoner & Williams, 82 Beekman, N. Y. .... 42  
**Door Staps and Holders.**  
Spangler & Co., Pittsburgh, Pa. .... 39  
**Drill Chucks, Manufacturers of.**  
Cushman & Co., 24 Broadway, N. Y. .... 38  
Lambertville Iron Works, Lambertville, N. J. .... 38  
**Drilling Machines, Manufacturers of.**  
Thorne, De Haven & Co., Philadelphia, Pa. .... 42  
**Drop Forgings.**  
Boker Hermann & Co., 101 and 103 Duane, N. Y. .... 38  
Rose Wm. & Bros., West Philadelphia, Pa. .... 38  
**Drop Presses.**  
Becher & Peck, New Haven, Conn. .... 22  
**Edge Tools, Manufacturers of.**  
The D. R. Barton Tool Co., Rochester, N. Y. .... 13  
Doscher M. & G. & Co., N. Y. .... 25  
**Elevators, Manufacturers of.**  
Crane Bros. Mfg. Co., Chicago, Ill. .... 9  
Mason Volney W. & Co., Providence, R. I. .... 40 & 42  
Stokes & Parsons, Philadelphia, Pa. .... 42  
**Elevator Buckets.**  
Rivet Bucket Co., Chicago, Ill. .... 39  
Rowland F. E., Brooklyn, N. Y. .... 39  
**Emery Wheels.**  
Lehigh Valley Emery Wheel Co., Weisport, Pa. .... 42  
**Engineers, Machinists, &c.**  
Southern States Coal, Iron & Land Co., South Pittsburg, Tenn. .... 6  
Toll Joseph C., 10 Barclay, N. Y. .... 6  
**Engines, Marine.**  
Brown Caloric Engine Co., 57 Lewis, N. Y. .... 38  
**Engines (Locomotive).**  
Baldwin Locomotive Works, Philadelphia, Pa. .... 4  
**Engines, Steam, Manufacturers of.**  
Ervin Chas. W. & Co., Kensington, Phila. .... 38  
Fitchburg Steam Engine Co., Fitchburg, Mass. .... 13  
Landis F. & A. B., Lancaster, Pa. .... 13  
Lovegrove & Co., Philadelphia, Pa. .... 13  
Payne B. & Sons, Corning, N. Y. .... 13  
Hayley & Wells, Birmingham, N. Y. .... 22

**Kitchen Sinks.**  
Magee Furnace Co., Boston, Mass. .... 28  
**Lanterns, Manufacturers of.**  
Diez R. E. (Tubular) 41 and 43 Fulton, N. Y. .... 2  
Horse, 45 Fulton, N. Y. .... 2  
**Lathe Dogs.**  
North Selden G., Philadelphia, Pa. .... 12  
**Lathes.**  
Johnson, Jr. Israel H. & Co., Philadelphia, Pa. .... 28  
Shepard H. L. & Co., Cincinnati, O. .... 40  
**Lawn Mowers.**  
Mast, Foss & Co., Springfield, O. .... 26  
**Lead Pipe, &c., Manufacturers of.**  
Barber, Farrell & Co., N. Y. .... 34  
**Levels.**  
Diston Henry & Sons, Philadelphia, Pa. .... 29  
**Locks, Manufacturers of.**  
Bannan Wilson, Broadway and Kosuth, Brooklyn, N. Y. .... 26  
D. K. Miller Lock Co., Philadelphia, Pa. .... 26  
Hoyt Fred J., 733 Broadway, N. Y. .... 26  
Hoyt, Wood & Co., New York, N. Y. .... 26  
Smith & Eggo Mfg. Co., Bridgeport, Conn. .... 26  
Stewart & Mattson, Philadelphia, Pa. .... 26  
Union Nail Co., 20 Chambers, N. Y. .... 26  
Yale Lock Mfg. Co., 53 Chambers, N. Y. .... 26  
**Machinery, Manufacturers of.**  
Biles & Williams, 107 Plymouth, Brooklyn, N. Y. .... 41  
Bishop, Wood & Co., Williamsburg, N. Y. .... 41  
Pittsburgh Mfg. Co., Pittsburgh, Pa. .... 41  
Pratt & Whitney Co., Hartford, Conn. .... 41  
R. Wm. & Co., 150 Hamilton, Philadelphia, Pa. .... 41  
The Bullard Machine Co., 14 Day, N. Y. .... 41  
Wetherell Robert & Co., Chester, Pa. .... 41  
**Machine Screws, Manufacturers of.**  
Lyons & Felle, 101 Wm. St., Williamsburg, N. Y. .... 41  
**Machinists' Tools, Manufacturers of.**  
Blaisdell P. & Co., Worcester, Mass. .... 34  
Frasse & Co., 62 Chambers, N. Y. .... 34  
**Malleable Iron Castings, Manufacturers of.**  
Hammer & Co., Bradford, Conn. .... 4  
**Mallets.**  
N. Y. Handle and Mallet Works, 456 E. Houston, N. Y. .... 36  
**Manganese.**  
Pyroclastic Manganese Co., 214 Pearl, N. Y. .... 35  
**Measuring Tapes.**  
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N. Y. .... 9  
**Meat Chopping Machinery.**  
Murray Iron Works, Burlington, Iowa. .... 8  
**Metal Dealers and Brokers.**  
Dickerson, Van Dusen & Co., 25 and 27 Cliff, N. Y. .... 4  
Greig H. L. & Co., 108 Walnut, Philadelphia, Pa. .... 5  
Hoskins W. A., Chattanooga, Tenn. .... 6  
Purves A. & Son, 208 South and Penn, Phila. .... 5  
Quincy J. W., 98 William, N. Y. .... 39  
St. Louis, Mo. .... 39  
**Metal Elbows.**  
Hogen Elbow Co., Cleveland, O. .... 27  
**Metallurgists.**  
Britton J. Blodgett, 339 Walnut, Philadelphia, Pa. .... 5  
**Metals Perforated.**  
Loyd G. & Co., 187 W. 4th, N. Y. .... 2  
**Metal Roofing.**  
Brass Goods Mfg. Co., 260 Pearl, N. Y. .... 2  
**Mica.**  
Chester Mica & Porcelain Co., 87 Liberty, N. Y. .... 36  
**Miners' Candles, Manufacturers of.**  
James Boyd's Sons, 10 and 12 Franklin, N. Y. .... 40  
**Mineral Lands, Dealer in.**  
Hoskins W. A., Chattanooga, Tenn. .... 6  
**Mineral Wool.**  
Elber & Alexander D., 264 Broadway, N. Y. .... 5  
**Models.**  
Burrows Wm., 50 Fulton, N. Y. .... 42  
Eberhard Geo. F. & Co., Canton, O. .... 42  
**Mouse Traps.**  
Ripley Mfg. Co., 108 Beekman, N. Y. .... 43  
**Nails.**  
Zug & Co., Pittsburgh, Pa. .... 4  
**Nail Machinery.**  
Coyne & Hatry, Pittsburgh, Pa. .... 4  
**Nickel Plates.**  
Hoskins Wm. & Co., 374 N. Seventh, Philadelphia, Pa. .... 39  
Jackson Geo. W., 21 E. 13th, N. Y. .... 39  
**Nickel Platers' Supplies.**  
Coff A. T., 47 Beekman, N. Y. .... 39  
Condit, Leonard & Co., New York, N. Y. .... 39  
Zucker & Levett, 539 and 541 W. 51st, N. Y. .... 39  
**Night Latches.**  
Many Francis, 143 Chambers, N. Y. .... 42  
**Norway Shapes, Rollers of.**  
Randall & Jones, 10 Oliver, Boston, Mass. .... 42  
**Note Broker.**  
Gaulleud F. W., 3 and 5 Wall, N. Y. .... 4  
**Nut Tapping Machines.**  
Howard Iron Works, Buffalo, N. Y. .... 4  
**Nuts, Bolts, etc., Manufacturers of.**  
Fuller Bros. Co., 135 Greenwich, N. Y. .... 4  
Haskell W. H. & Co., Pawtucket, R. I. .... 4  
Lewis, Oliver & Phillips, Pittsburgh, Pa. .... 13  
Roseberry Geo. D., Portville, Pa. .... 42  
Russell, Birdall & Ward, Port Chester, N. Y. .... 42  
Shelton Co., Birmingham, Conn. .... 42  
Smith, Sutton & Co., Pittsburgh, Pa. .... 42  
Singer, Nimick & Co., Pittsburgh, Pa. .... 42  
Standard Steel Works, Philadelphia, Pa. .... 42  
Steel Restorative Works, 10 Greenwich av., N. Y. .... 42  
The Edgar Thomson Steel Co., 57 Broadway, N. Y. .... 35  
Wardlaw S. & C., Sheffield, England. .... 34  
Clark & Co., 102 and 104 W. 27th, N. Y. .... 9  
**Steel Spiral Springs, Manufacturers of.**  
Clayton Jas., 11 Water, Brooklyn, N. Y. .... 8  
Chattillon John & Sons, 21 Cliff, N. Y. .... 7  
Stanton John & Sons, 10 and 12 Cliff, N. Y. .... 7  
**Stone, Ironware.**  
Metal Stamping & Enameling Co., St. Louis, Mo. .... 3

**Saws, Manufacturers of.**  
American Saw Co., Trenton, N. J. .... 12  
Boynton, E. M., 80 Beekman, N. Y. .... 42  
Diston Henry & Sons, Phila. .... 8  
Peace & Hogen, Williamsburg, N. Y. .... 12  
Wheeler, Madden & Clemens Mfg. Co., Middle-town, N. Y. .... 12  
**Saw Frames, Wood, Manufacturers of.**  
Peace Harvey W., Williamsburg, N. Y. .... 12  
**Scales, Manufacturers of.**  
Randall Mfg. Co., Rutland, Vt. .... 7  
Chattillon John & Sons, 21 Cliff, N. Y. .... 7  
Riehle Bros., 9th above Master, Phila. .... 13  
**Screws, Manufacturers of.**  
Sempie & Birge Mfg. Co., St. Louis, Mo. .... 10  
American Screw Co., Providence, R. I. .... 16 & 17  
Miles F. S., 205 Quarry, Phila. .... 10  
Philadelphia Screw Co., Philadelphia, Pa. .... 10  
Russell & Erwin Mfg. Co., New York. .... 10  
**Screws, Importers of.**  
Bruce Geo. W., 11 Platt, N. Y. .... 6  
**Screw Cutting**



## JESSOP'S Patent Adjustable Pipe Tongs.



THE BEST IN THE MARKET.

Send for Samples.

**EATON, COLE & BURNHAM COMPANY,**  
Sole Manufacturers,

58 John Street, New York.



## TACKS.

**Swedes Iron, Upholsterers', Gimp & Cut Tacks.**

TINNED, LEATHERED AND LARGE HEAD IRON CARPET TACKS.

Trunk, Clout and Finishing Nails, Brads, Patent Brads, &c.

Lining, Saddle and Tufting Nails, Coffin Tacks and Tufting Buttons.

COPPER, ZINC, STEEL, AND SWEDS AND COMMON IRON SHOE NAILS, &c.

Regular and Chisel Pointed Boat Nails of Copper, Iron or Galvanized, Copper, Brass

and Iron Wire Nails (Blued, Bright or Tinned), Escutcheon Pins, Chair and Cigar

Box Nails, 2d & 3d Fine Nails, Roofing Tacks and Nails, &c., &c.

Made by the **AMERICAN TACK CO.,** Fairhaven, Mass.

A full line of goods may be found at the

**NEW YORK SALESROOM, No. 117 Chambers Street.**

SAM'L COULTER.

A. FLAGLER.

JAS. FORSYTH.

## COULTER, FLAGLER & CO.,

87 Chambers & 69 Reade Sts., New York.

**Hardware Manufacturers' Warehouse.**

### OFFICE AND WAREHOUSE OF

UNION HARDWARE CO.

RUGG MFG. CO.,

Draw Knives, Chisels, &c.

DEUSE BROS.,

Bits, Corkscrews, &c.

RICHARDSON BROS.,

Saws of all kinds.

BROOK'S EDGE TOOL CO.'S

Axes, Hatchets, &c.

M. PRICE,

Hatchets, &c.

J. & W. ROTHERY,

Extra Hand Cut Files.

L. D. FROST,

Carriage Bolts, Refined and Nor-

way Iron.

COWLES HARDWARE CO.,

Screwdrivers, Mining Knives, &c.

RIDER, WOOSTER & CO.,

Anti-Friction Barn Door Hangers,

&c.

H. B. HAWLEY,

Shears of all kinds.

WALDEN KNIFE CO.,

Pocket Cutlery.

AMERICAN SCREWS.

N. Y. ANTI-FRICTION METAL CO.'S

Babbitt Metals.

HOWARD,

Razor Straps.

C. FORSCHNER,

Spring Balances.

P. LOWENTRAUT & CO.,

Dividers, Calipers, &c.

## THE CONNECTICUT VALLEY MFG. CO.,

CENTERBROOK, CONN., Manufacturers of

**Lewis' Patent Single Twist Spur Bits,**



**GERMAN GIMLET BITS, etc.**



Send for our illustrated price list and discounts.



Price, \$5.00.  
In Morocco Case,  
\$6.00.

**MICROMETER CALIPER,**  
Made by THE VICTOR SEWING MACHINE CO.  
Middletown, Conn.

This attractive and very desirable tool will be found more reliable and convenient than the Vernier Caliper, and to Machinists and Tool makers it is indispensable on work requiring very accurate and close measurement. Its capacity is one inch, and is graduated to one thousandths, but can readily be set one-half and quarter thousandths; and is so constructed that any wear resulting from use can be readily adjusted.

**GEO. M. SCOTT,**  
Bellows Manufacturer,

Johnson Street,

Cor. 22d St.,

CHICAGO, ILL.



## McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

## BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

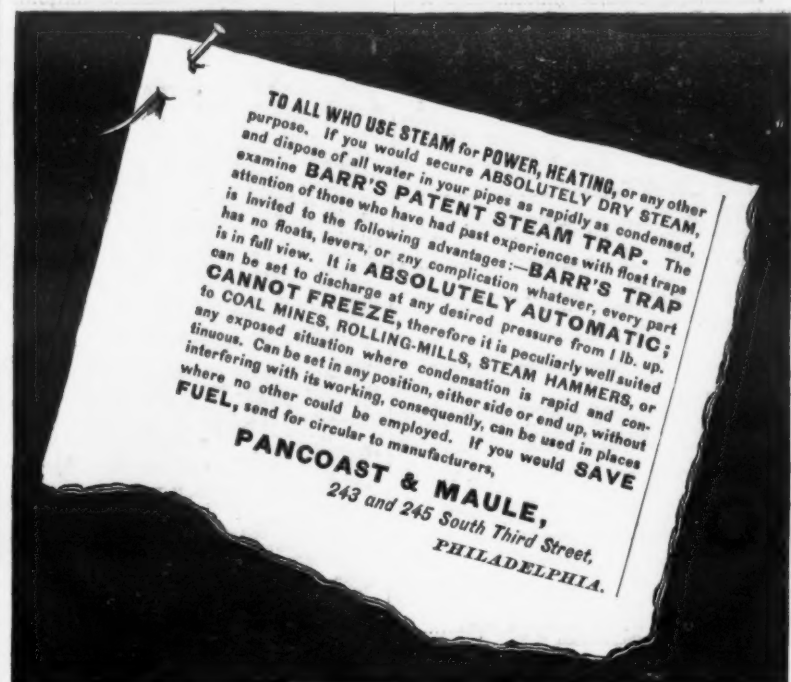
Iron Pipe and Fittings, Plain and Galvanized.

**PLUMBERS' MATERIALS.**

New Illustrated Catalogue and Price List sent by express to the Trade on application.

Factory, Paterson, N. J.

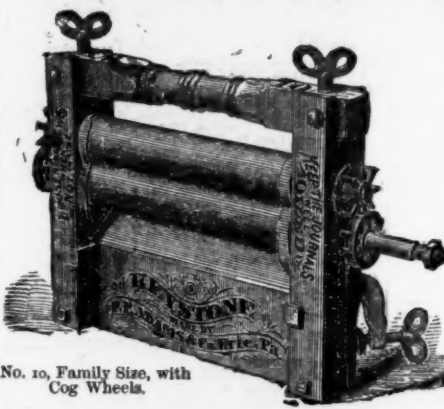
56 John Street N. Y.



TO ALL WHO USE STEAM for POWER, HEATING, or any other purpose. If you would secure ABSOLUTELY DRY STEAM, and dispose of all water in your pipes as rapidly as condensed, examine **BARR'S PATENT STEAM TRAP.** The attention of those who have had past experiences with float traps is invited to the following advantages:—**BARR'S TRAP** has no floats, levers, or any complication whatever, every part is in full view. It is **ABSOLUTELY AUTOMATIC;** can be set to discharge at any desired pressure from 1 lb. up to **COAL MINES, ROLLING-MILLS, STEAM HAMMERS,** or any exposed situation where condensation is rapid and continuous. Can be set in any position, either side or end up, without interfering with its working, consequently, can be used in places where no other could be employed. If you would **SAVE FUEL,** send for circular to manufacturers.

**PANCOAST & MAULE,**  
243 and 245 South Third Street,  
PHILADELPHIA.

## KEYSTONE WRINGERS.



No. 10, Family Size, with Cog Wheels.

### Wood Frame Cog-Wheel Wringers.

No.	Size of Rolls.	Price per doz.
10	10X1 1/2	\$60.00
12	10X1 3/4	63.68
16	11X1 1/2	68.00
18	11X1 3/4	71.00

### Wood Frame Friction Wringers.

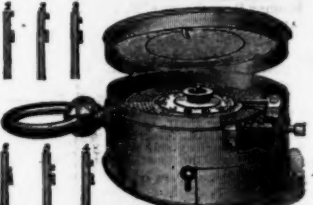
No.	Size of Rolls.	Price per doz.
1 1/2	10X1 1/2	\$51.00
2	10X1 3/4	54.00
3	11X1 1/2	62.00

### Self-Adjusting Iron Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
2 1/2	10X1 1/2	51.00
4	10X1 3/4	54.00
4	11X1 1/2	62.00

Warranted greater capacity than any other wringer.  
Send for price list of other goods for home and export trade.

**F. F. ADAMS & CO.,** Erie, Pa.



## BUERK'S Watchman's Time DETECTOR.

IMPORTANT FOR ALL LARGE CORPORATIONS  
AND MANUFACTURING CONCERNS.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with the ordinary watch clocks. A small, inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

N. B.—The suit against Ingham & Co., of New York, was decided in my favor, June 10, 1874. Another suit has been decided against them and a fine assessed Nov. 11, 1876, for selling contrary to the order of the Court. Persons using clocks infringing on my Patent will be dealt with according to law.

**J. E. BUERK, Proprietor,**

P. O. Box 979.

No. 230 Washington Street, Boston.

In sending for circular or ordering the above, please mention this paper.



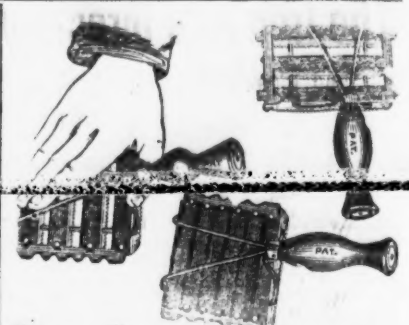
**THE MAGEE  
Patent Sink.**  
**MAGEE FURNACE CO.,**  
Boston, Mass.

Universally acknowledged to be without an equal as a Kitchen Sink. Send for Descriptive Circular and Prices.

## Daman STANDARD HOLLOW AUGERS.

**C. C. HARLOW & CO.,**  
BRIDGEWATER, MASS.

Manufacturers of DAMAN STANDARD HOLLOW AUGERS.—Universally acknowledged superior to any other in the market. They have recently been improved, making them, as now offered to the trade, the most perfect tools of their kind, either in design, material or workmanship. BROKE AND DOWEL TRIMMERS.—The very best as well as the cheapest. METALLIC COMPRESSIVE FLOW PLANE.—Made of solid cast steel and of sub metal. Of an entirely new design. Can be used as Groover, Dado and Rabbet Plane, in any direction of the grain, and also as a Match Plane. COMB'S SENSE DOOR SPRING.—The most durable and cheapest Door Spring yet made. LEAD PIPE CUTTERS.—To cut lead pipe in any position and without chips or burr. Please send for circulars and prices.



## The Perfect Comb.

We call your attention specially to our new patent end-lead wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horses while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

**THE LAWRENCE COMB CO.**

Factory and Office.

322 2d Ave., cor. 22d St., N. Y.

**WM. S. CARR & CO.**

Sole Manufacturers of

**CARR'S**

PATENT

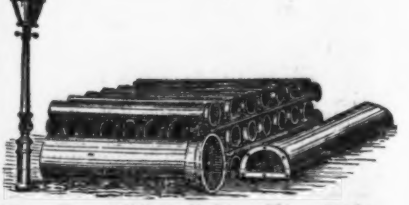
Water

Closets,

PUMPS, CABINET WOOD WORK, &c.

106, 108 & 110 Centre Street,

Factory, Mott Haven, N. Y.



## R. D. WOOD & CO.,

Philadelphia,

Manufacturers of

## Cast Iron Pipe

FOR WATER AND GAS.

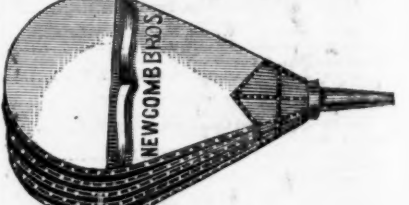
Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

## NEWCOMB BROS.,

Manufacturers of



586 Water St., N. Y.

**TENNIS & WILSON, Agents,**

81 Beekman Street, N. Y.

I invite special attention to my

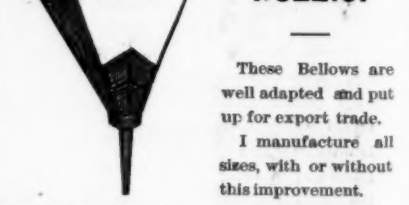
**PATENT**

**Reversible**

**Nozzle.**

These Bellows are well adapted and put up for export trade.

I manufacture all sizes, with or without this improvement.



**NEW YORK and BOSTON**

Pattern

## STORE TRUCKS.

Railroad, Warehouse, Platform

and Block Trucks, all sizes.

Manufactured only by

**H. N. HUBBARD,**

323 East 22d St., New York.

Reduced prices. Catalogues furnished.

**CHAMPION**

ELASTIC EXPANSION

RUBBER BUCKET

FOR

CHAIN PUMPS

PATENTED AUG. 14, 1874.

SEND FOR PARTICULARS

EDWARD MANUFACTURING CO.

CANTON, OHIO.

Sole Manufacturers



# HENRY DISSTON & SONS

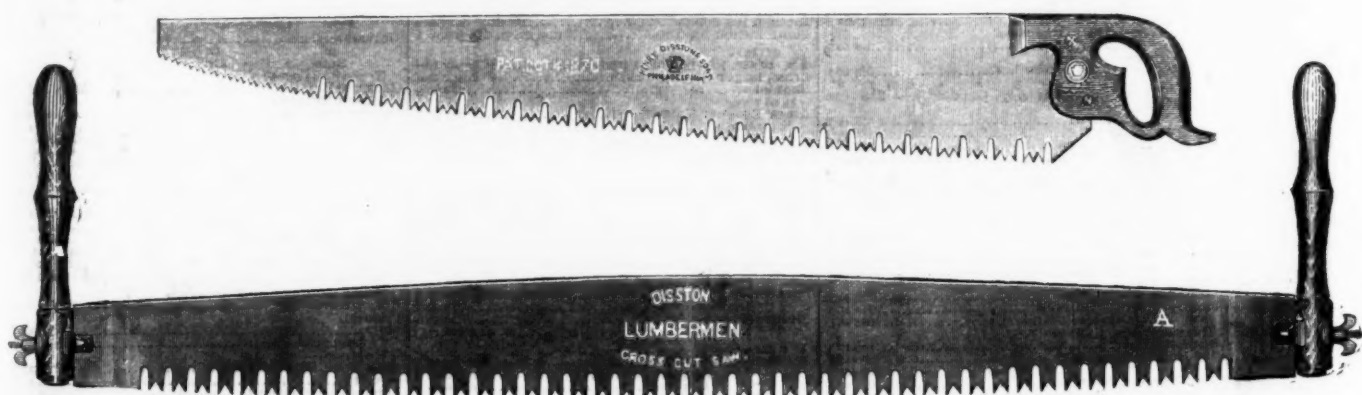
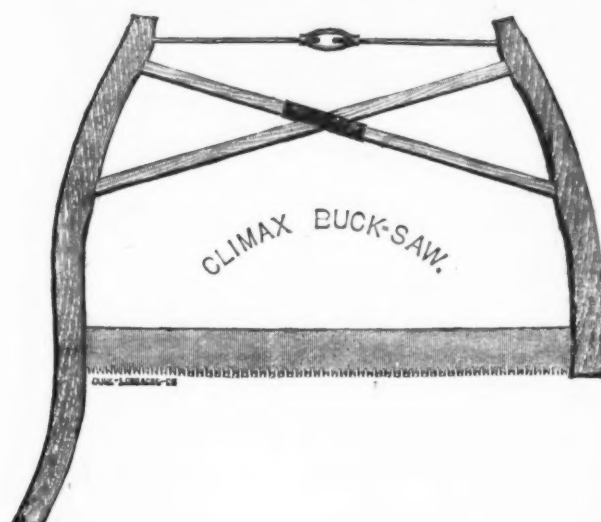
Keystone Saw, Tool, Steel & File Works,

FRONT AND LAUREL STREETS, PHILADELPHIA.

Branch Works, Tacony, Philadelphia.

Branch House, Randolph & Market Streets, Chicago, Ill.

## OUR CELEBRATED CROSS-CUT AND WOOD SAWS.





[illegible]



**Sundries.**

Aphatu m..... 00  
Benzine..... gal. 75  
Chain..... 10  
" Block..... 10  
Drier, Patent, Am n..... asst cans, 10c; keg, 20  
Frosting..... 30  
Glue, White..... 33 @ 40  
Sheet..... 50  
Glaxier's Polia Zinc..... 50  
Gum, Copal..... 50  
Damar..... 50  
" Shellac, English..... 50  
" " " dark..... 50  
Litharge, English..... 50  
Mineral Wool..... 50  
Pumic Stone, selected Lump..... 15 @ 150  
" " powdered..... 50  
Putty, in bladders..... 50  
" in bulk..... 50  
Rotten Stone, soft, English..... 50  
Spirits Turpentine..... 50  
Whiting Spanish..... 50

**Glass.**

FRENCH, FINEST GLASS.  
Prices current per box of 50 feet.

Single Thick.—discount 6x & 5		1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	75.	\$ 7.50	\$ 6.75	\$ 6.25	\$ 5.75
11 x 14 to 15 x 24.....	75.	8.50	7.75	7.25	6.75
13 x 22 to 20 x 30.....	75.	10.75	9.75	8.75	" 4
15 x 26 to 24 x 30.....	75.	12.25	10.75	9.00	
20 x 28 to 24 x 30.....	75.	13.00	11.50	9.75	
26 x 37 to 28 x 44.....	75.	14.50	13.25	10.75	
26 x 40 to 30 x 50.....	75.	15.00	14.00	11.25	
30 x 32 to 30 x 54.....	75.	16.00	14.50	12.00	
30 x 36 to 34 x 50.....	75.	17.25	16.50	13.50	
34 x 38 to 34 x 50.....	75.	18.25	17.25	15.00	
34 x 50 to 40 x 50.....	75.	20.75	18.75	17.25	

Double Thick.—Discount 6x & 15

SIZES.		1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	75.	\$12.00	\$11.00	\$10.00	\$ 9.75
11 x 14 to 15 x 24.....	75.	13.75	12.50	11.75	10.75
13 x 22 to 20 x 30.....	75.	17.25	15.75	14.00	
15 x 26 to 24 x 30.....	75.	19.75	17.25	14.50	
20 x 28 to 24 x 30.....	75.	21.00	18.50	16.75	
26 x 35 to 28 x 44.....	75.	23.25	21.25	17.25	
26 x 40 to 30 x 50.....	75.	24.00	22.50	18.00	
30 x 32 to 30 x 54.....	75.	25.75	23.25	19.25	
30 x 36 to 34 x 50.....	75.	27.25	25.00	21.75	
34 x 38 to 34 x 50.....	75.	29.25	27.75	24.00	
34 x 50 to 40 x 50.....	75.	33.25	30.00	27.75	

Sizes above 40 x 60—\$10.00 per box extra for every five inches.

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 44 inches in length, and not making more than 81 united inches, will be charged in the 81 united inches brace.

**& CO.,**

facturers and Dealers in

**Iron & Nails,**

**Wrenches, Screws, &c.**

**POST HOLE AUGER,**

able and the handiest Earth Auger in Market. It has three holes while any other Auger is boring one hole only in clay, sand, gravel or muck soil, and will cut out the use of shovel or spade to start it. Price \$1.00 the trade, \$3.00 each. Less 20 per cent.



**SPECIALTIES.**

Tree Nails, National Horse Nails, Buffalo Horse Nails, National Horse Shoes, Walker Horse Shoes, Horse Shoes, Toe Calks, Cast Iron Nails, Anvils and Vises, Horse Nails.

Special Brand—"KING OF THE FOREST," WOOD CHOPPER."

**Hand & Power**

**Tools, Drills, Etc.**

**PLATE SHEARS,**

No. 5 will cut **7-16 Iron** through center of sheet.

Manufactured only by

**G. B. Walbridge & Co**

**83 Reade St.,**

**NEW YORK.**

**E. E. SOUTHER & BRO.,**

**St. Louis, Mo.,**

**AGENTS.**

**PARDE & CO.,**

ors of

**TAMPING WORKS.**



TRADE MARK.

ERS OF

**TANNED TIN WARE.**

Shovels, Spoons, Toilet Ware, Tin Rods, Iron Clad and Double Rim Cream Freezers, "Rankers", "Lifting" Transportation Cans, ers', Druggists' and Fla Ware.

House Furnishing Hardware.

**& CO., Buffalo, N. Y.**

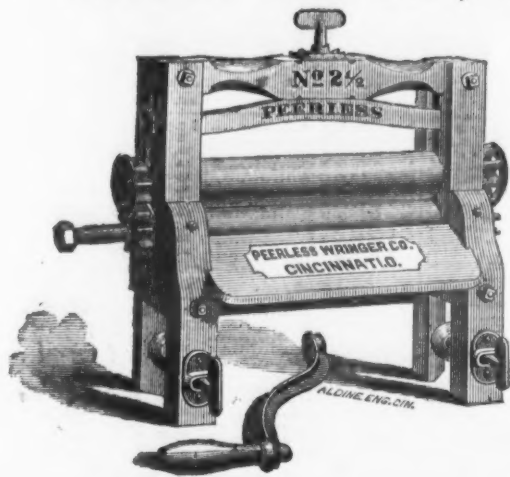


# PEERLESS WRINGER CO

ROBERT SIMPSON, Pres't.

Established 1865.

GEO. E. GAULT, Sec'y.

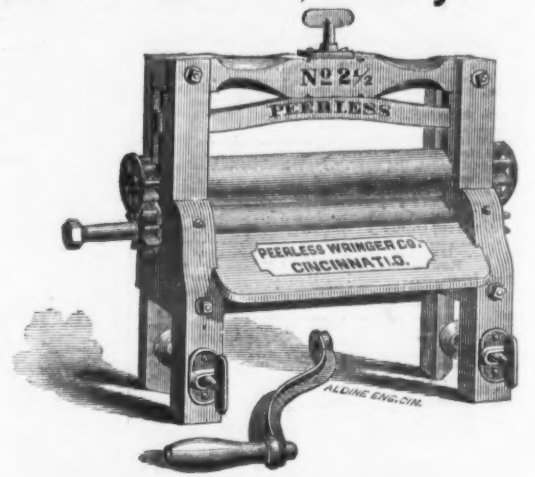


FACTORY,

N. W. Cor. Front and John Sts., Cincinnati, O.

NEW YORK OFFICE,

106 Chambers Street.

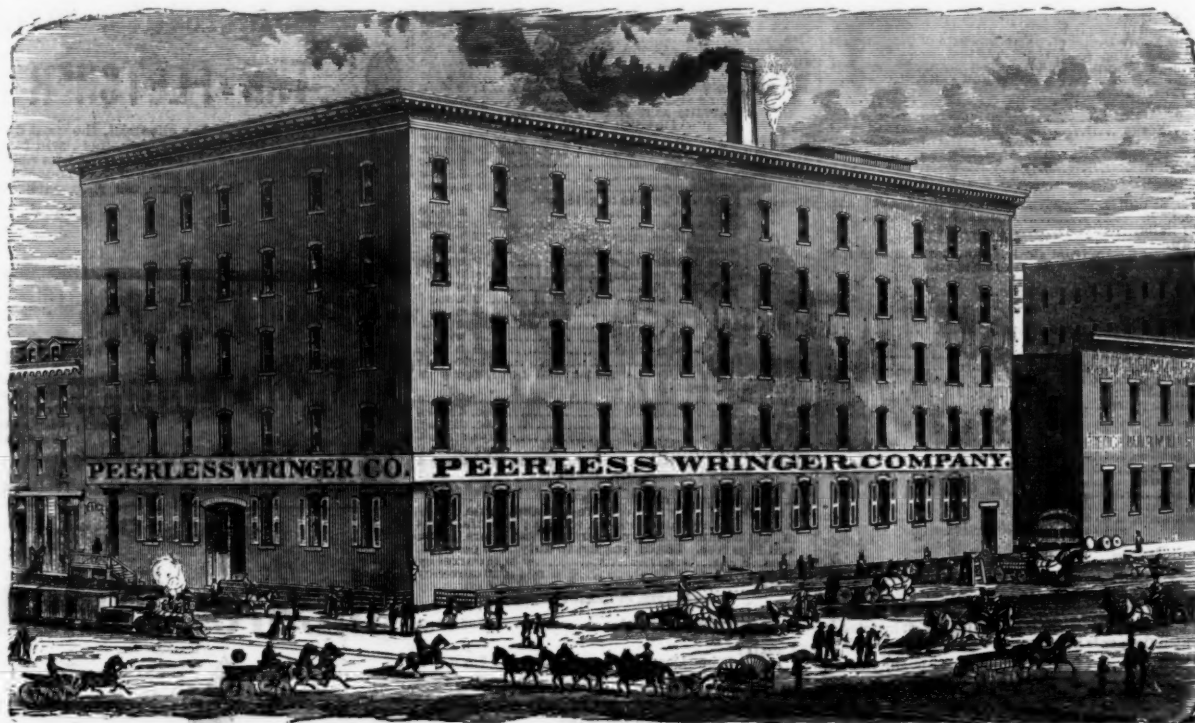


## THE NEW AND IMPROVED PEERLESS WRINGER,

Which, in addition to the **HIGHEST POSSIBLE FINISH**, will combine the following

### Points of Excellence.

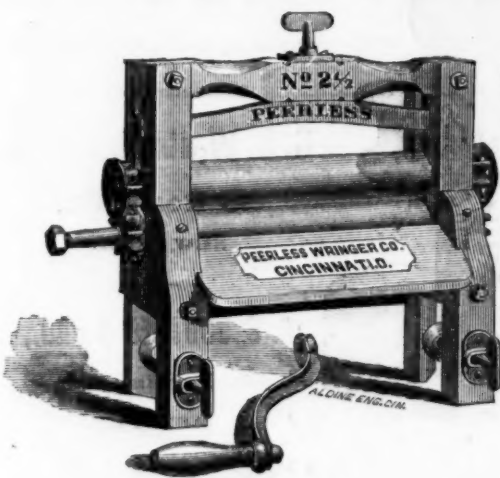
Solid White Rubber  
Rolls,  
Metal Journal Boxes,  
Maple Frames,  
Hickory Cross Bars,  
Only Patent Crank  
Fastening,  
Only Wringer with  
Rubber Fastening  
Pads.



### Points of Excellence.

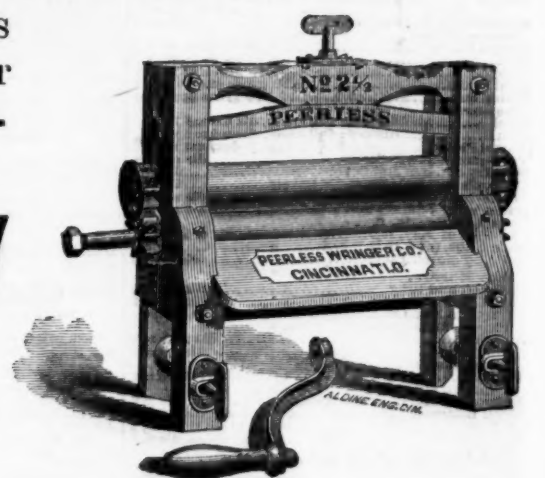
Wrought Iron Thumb  
Screws,  
Hickory Spring Bars,  
Mold Rubber Springs,  
Best and most Simple  
Tub Attachment,  
The Apron or Clothes  
Guide.

**Frames Polished and Handsomely Finished.**



All Iron Work Perfectly Galvanized and Escutcheons around all Thumb Screws. Nothing can get out of order or be broken. No expense spared to render them Perfect. Superior to any Wringer in the Market.

**WARRANTED DOUBLE THE CAPACITY  
OF ANY  
PURCHASE GEAR WRINGER.**



The Peerless Wringers are sold to the trade by the following Jobbing Houses:

RUSSELL & ERWIN MFG. CO.,	New York.	ROGERS, ENGLE & CO.,	Dayton.	UDELL, SCHMEIDING & CO.,	St. Louis.
" " " "	Philadelphia.	LOOMIS, BARNETT & PRITZ,	"	F. A. WITTE & CO.,	"
EATON & DANA,	Boston.	WHITTAKER, HAYNES & CO.,	Toledo.	WICKERSHAM & LOWRIE,	Keokuk.
C. FOSTER & CO.,	Worcester.	BUHL, DUCHARME & CO.,	Detroit.	SICKLES, PRESTON & ADAMS,	Davenport.
EMERY, WATERHOUSE & CO.,	Portland, Me.	PRENTISS & WILEY,	"	J. D. SEEBERGER & CO.,	Des Moines.
W. H. COLE & SONS,	Baltimore.	GEO. C. WETHERBEE & CO.,	"	WEMOTT, HOWARD & CO.,	Dubuque, Iowa.
BYRNE & FITZSIMMONS,	Albany.	MORLEY BROS.,	East Saginaw.	STRONG, HACKETT & CHAPIN,	St. Paul.
TROY STAMPING WORKS,	Troy.	LAYMAN CAREY & CO.,	Indianapolis.	WM. M. WYETH & CO.,	St. Joseph.
MERRIAM & GREGORY,	Syracuse.	HILDEBRAND & FUGATE,	"	SHULTZ & HOSEA,	"
POLLOCK, WEAVER & GOSS,	Rochester.	A. G. AUSTIN & CO.,	Terre Haute.	DUNCAN, WYETH & CO.,	Kansas City.
PRATT & CO.,	Buffalo.	MIDDLETON, BARRETT & BOWEN,	Louisville.	J. F. RICHARDS & CO.,	"
FLEMING, AGNEW & CO.,	Pittsburgh.	HIBBARD, SPENCER & CO.,	Chicago.	J. F. RICHARDS & CO.,	Leavenworth.
JOSEPH WOODWELL & CO.,	"	FELIX, MARSTON & BLAIR,	"	BLISH, MISE & SILLIMAN,	Atchison.
THOS. BIRNEY & CO.,	"	BRIENTNALL, LAMB & CO.,	"	IRWIN & ELLIS,	Omaha.
LOCKWOOD, VAN DORN & MILLER,	Cleveland.	CLARK, QUIEN & MORSE,	Peoria.	D. & C. L. BAUM,	Lincoln, Neb.
KILBOURNE, JONES & CO.,	Columbus.	SIMMONS HARDWARE CO.,	St. Louis.	KNAPP, BURRELL & CO.,	Portland, Oreg.
PAPENHEIMER & LUDLOW HDW. CO.,	Cincinnati.				

**GIVE US A TRIAL ORDER.**



# H. D. SMITH & CO.,

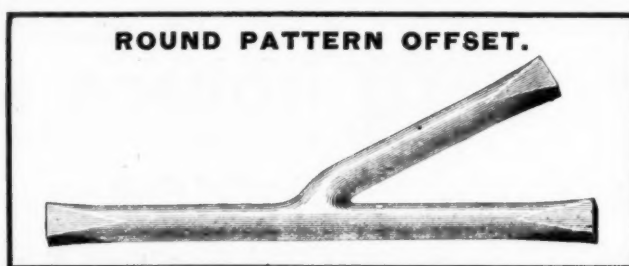
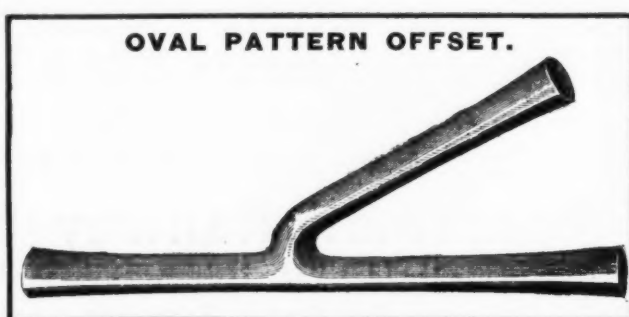
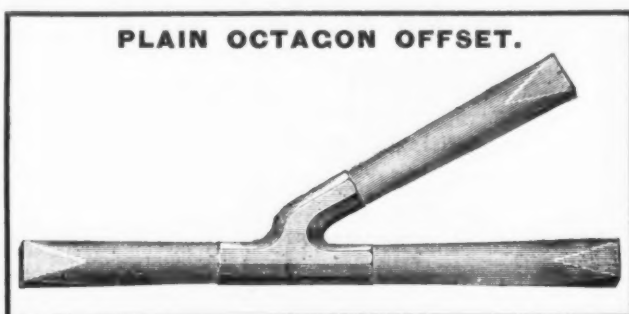
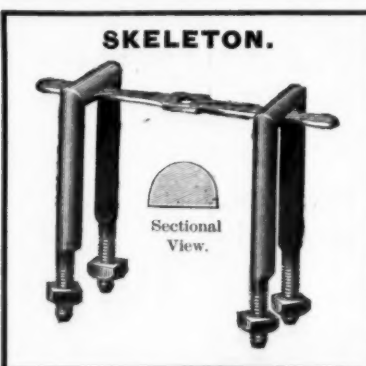
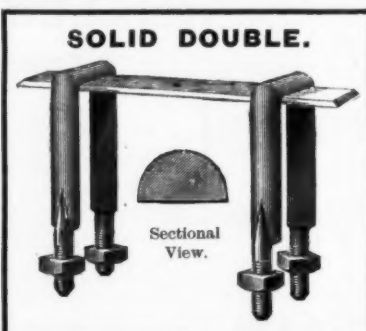
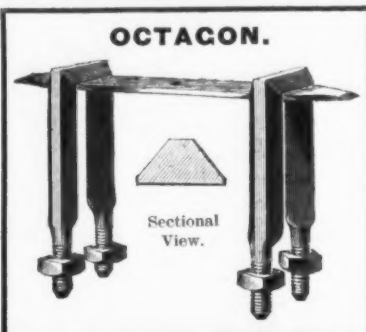
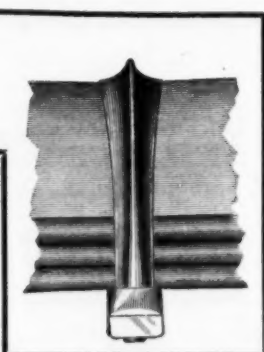
MANUFACTURERS,

Plantville, Conn.

## AXLE AND SPRING BAR CLIPS.

## SADDLE CLIPS.

## OFFSETS AND STAY ENDS.



See Illustrations on the two pages preceding this. For description of the above and other popular Forged Carriage Irons, send for 1877 Illustrated Price List.



Steel.

# R. H. WOLFF & CO.,

IMPORTERS OF

## IRON AND STEEL.

Sole Agents for the Sale of the Celebrated  
Pr. HOMOGENEOUS DEC. CAST STEEL, GUN BAR-  
RELS, MOULDS AND ORDNANCE.

Sole Agents for **COCKER BROTHERS, Limited,**  
Successors to **SAML. COCKER & SON, (ESTABLISHED 1752.)**  
**SHEFFIELD, ENGLAND.**

Sole manufacturers of  
"SC" **EXTRA' Cast Steel,**  
AND  
**CAST STEEL WIRE** for all purposes.

Sole Makers of  
Cocker's "Meteor" Wire Plates.  
Railroad Supplies and General Merchants.

Office and Warehouse, 46 Cliff Street, New York.

## F. W. MOSS,

Successor to **JOSHUA MOSS & GAMBLE BROS.**

**FRANKLIN WORKS, WADSWORTH BRIDGE WORKS, WALKLEY WORKS, SHEFFIELD, ENGLAND.**

## STEEL AND FILES.

Principal Depot, 80 John Street, New York.

**MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,**

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

**WARRANTED CAST STEEL,** especially adapted for **DIES and TURN-**

**PUNCHES** and all kinds of **MACHINISTS' TOOLS.**

1) Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools,

2) warranted not to crack in hardening of any size.

3) Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.

English Springs and Plow Plate Steel.

Sheet Cast Steel Shear, German, Round Machinery, Hammer, Fork and Shovel Steel

**GENERAL MERCHANT.**

## ALBANY & RENSSLAER IRON & STEEL CO.,

Troy, N. Y.,

Office in New York City, 56 BROADWAY.

## Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron.

AGENCIES IN BOSTON AND PHILADELPHIA.

## FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

## S. & C. WARDLOW,

Sheffield, England,

Manufacturers of the Celebrated

## Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Turning Tools, Dies, Files Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

## JONAS MEYER & COLVER,

CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND.

ATTERCLIFFE, Manufacturers of

## EXTRA BEST WARRANTED CAST STEEL,

For all Descriptions of Fine Tools.

**J., M. & C. Manufacture Tool Steel exclusively.**  
**N. DIAMOND & CO.,** Principal Agents for the United States and Canada.  
Office and Warehouse, 100-6 Ford Street, HARTFORD, CONN.



**BUCK BROS. Millbury, Mass.**

The most complete assortment in the U. S. of Shank, Socket Firmer and Socket Framing Chisels.

## PLANE IRONS.

Gauges of all lengths and circles, beveled inside or outside. Nail sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

Steel.

## SANDERSON BROTHERS & COMPY'S

### BEST REFINED CAST STEEL.

Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND and other Steels for sale by

**FRITH & TILESTON, Agents,**

EDWARD FRITH.  
WM. TILESTON.

No. 16 Cliff Street, NEW YORK.

**LABELLE STEEL WORKS.**

## SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

## STEEL.

Also Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa.

Represented at Boston by WYTHEBELL BROS., 21 Oliver St.; at Milwaukee by JOHN FRITZLAFF, 43 to 45 West Water St.; at Chicago by S. D. KIMBARK, 80 to 84 Michigan Ave.

## MIDVALE STEEL WORKS.

Works and Office, NICETOWN, PHILADELPHIA, PA.

MANUFACTURERS OF

## CRUCIBLE AND OPEN HEARTH STEEL,

Steel Locomotive and Car Wheel Tires. Steel Axles of every description.

STEEL FORGINGS UP TO 8000 lbs. IN WEIGHT.

Solid Steel Castings, Hammer Dies, Frogs, Crossings, etc.

**BEST TOOL, MACHINERY AND SPRING STEELS.**

WM. SELLERS, Pres.

CHAS. A. BRINLEY, Supt.

MARRIOTT C. SMYTH, Sec. & Treas.

## MILLER, METCALF & PARKIN

### Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all Descriptions of



## STEEL,

EQUAL TO ANY IN THE MARKET.

Office, 81 Wood Street, - PITTSBURGH, PA.

Established 1810.

## J. & RILEY CARR,

SHEFFIELD, ENGLAND.

Manufacturers of the "Celebrated

"DOG BRAND" FILES.

Also of Superior

## STEEL

For Drills, Cold Chisels, Tools, Taps, Dies, &c.

**COLD ROLLED STEEL** for Clock Springs, Corsets, &c.

**SHEET CAST STEEL** for Springs, Saws, Welding and Stamping Cold, &c.

GERMAN, MACHINERY, ENGLISH AND SWEDISH SPRING STEEL,

And all other descriptions for machinists and agricultural purposes.

Warehouse, 30 Gold Street, New York.

Near John Street.



## The Ironmonger & Metal Trades' Advertiser.

A WEEKLY TRADE JOURNAL.

PUBLISHED EVERY SATURDAY, AT 44a CANNON STREET, LONDON, E. C.,

And issued in 53 Numbers, one in the form of a handsome Diary and Text Book,

adapted to the Ironmongery and Metal Trades.

"The Ironmonger" was established in 1850, and is the oldest and chief representative organ of the Iron, Hardware and Metal Trades. This journal stands pre-eminent amongst trade publications, and possesses all the advantages of the Commercial Newspaper and a high-class literary Magazine. The principal characteristics of the "The Ironmonger" are the accuracy of its Market Reports and Prices Current; the intrinsic value of its Home, Foreign and Colonial Correspondence; the impartiality of its criticism upon the leading novelties of the day; its careful selection of Agricultural, Legal and Magisterial News appertaining to the Metal Trades; the completeness of its list of Patents and General Statistics, and its multiplicity of classified Advertisements. The main object of this publication is to furnish a faithful record of all things of specific value to those interested in the manufacture, purchase, consignment, shipment or sale of Hardware, Arms and Ammunition, Oils, Seeds, Implements, Machinery and Metals.

The Foreign Supplement is published every fourth Saturday, in English, French, German, Spanish and Italian, giving a selection of suitable news and advertisements. Full terms on application to the office in London.

**GREAT BRITAIN, IRELAND, Australasia, Belgium, Brazil, Canada, Cape of Good Hope, China, France, Germany, Greece, India, Italy, River Plate, Russia, Spain, the West Indies, and United States of America**

are the principal places where *The Ironmonger* is circulated, amongst Ironmongers, Merchant Shippers, Foreign and Colonial Store Dealers, Factors, Mechanical and Mining Engineers, and the Users of Steam Power and Engineering Plant.

This class of persons constitutes the majority of the subscribers to *The Ironmonger*, and the value of this publication as an influential advertising medium cannot, therefore, be overrated.

Subscription, 20s. per year, payable in advance; commencing from any date.

Post free to every country in the world.

American subscribers can remit \$3 as a year's subscription, either direct to the London Office, or through the publisher of *The Iron Age*, 3, Beade Street, New York.

Steel.

## R. MUSHET'S

### Special Steel

FOR

**LATHES, PLANERS, &c.**

Turns out at least double work by increased speed and feed, and cuts harder metals than any other Steel. Neither hardening nor tempering required.

Sole Makers

**SAMUEL OSBORN & CO.,**  
Sheffield, England.

Represented by

**RANDALL & JONES,** 10 Oliver St., Boston.  
BRANCH, CROOKES & CO., Vine Street, St. Louis, Mo.

## STEEL RESTORATIVE WORKS

119 Greenwich Ave., near W. 13th St.,

NEW YORK,

Manufacturers of Bauer's Peerless Steel Restorative Compound, wherein all Steel Tools, such as Dies, Cutters, Jewelers' Rollers, &c., can be hardened, and they will stand five times as long as has ever been accomplished by any other process.

Gunpowder.

## GUNPOWDER

### DUPONT'S

Sporting, Shipping, and Mining POWDER.

DUPONT'S GUNPOWDER MILLS,

ESTABLISHED IN 1801,

Have maintained their great reputation for 75 years. Manufacture the

**Celebrated Eagle Ducking, Eagle Rifle, & Diamond Grain Powder.**

THE MOST POPULAR POWDER IN USE.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER.

of all kinds and descriptions.

For sale in all parts of the country. Represented by

**F. L. KNEELAND**

70 Wall Street, NEW YORK.

## CUN POWDER.

Laflin & Rand Powder Co.

No. 26 Murray Street, New York,

Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as

**ORANGE LIGHTNING, ORANGE DUCKING, ORANGE RIFLE**

more popular than any Powder now in use.

**Blasting Powder and Electrical Blasting Apparatus.**

**Military Powder** on hand and made to order.

**SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.**

Pamphlets showing sizes of grain sent free.

## Torrey's Door Springs

### AND

### Ice Cream Freezers.



**P. R. DUNNE, Manufacturer,**

No. 182 Fulton Street, New York.

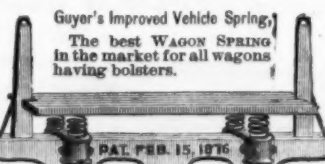
Send for prices.



**R. BLISS MFG. CO.,**

Manufacturers of Hand and Bench Screws, Cabinet and Piano-Forte Makers' Clamps, Chisel Handles, Carpenters' Mallets, Croquet Games, Tourne, Boys' Tool Chests, Architectural Building Blocks, Toys, &c.

Pawtucket, R. I.



Guyer's Improved Vehicle Spring,

The best WAGON SPRING

in the market for all wagons

having bolsters.

PAT. FEB. 15, 1876

Sold by  
**DEERE, MANSUR & CO.,** St. Louis, Mo.  
**GEORGE A. LOWE,** Salt Lake City, Utah.  
**GEORGE W. & S. TAYLOR,** Smyrna, Del.  
**R. P. SPIKER,** Piqua, Ohio.  
**WALL & WITTE,** Denver, Col.  
**A. L. & E. F. GOSS,** Lewiston, Maine.

Circulars and price lists furnished. Address

**THE LAFAYETTE WAGON SPRING CO.,**

Sole Manufacturers, Lafayette, Ind.



## Steel.

THE EDGAR THOMSON STEEL CO.,  
LIMITED.

MANUFACTURERS OF



General Office and Works at Bessemer Station (Penn. R. R.), Allegheny County, Pa.

New York Office, 57 Broadway.

The members of the Edgar Thomson Steel Company, Limited, have had large experience in manufacturing and in railway management; their works are the most complete in the world, with all the late improvements, and are located in the best Bessemer metal district in the United States, and their managing officers are experienced in the manufacture of Bessemer Steel.

The Company warrants its rails equal in quality to any manufactured in the United States. Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

Branch Office and P. O. Address, No. 48 Fifth Ave., Pittsburgh, Pa.  
D. McCANDLESS, Chairman. W. M. P. SHINN, General Manager.

## Pyrolusite Manganese Co.,

MINERS, DEALERS AND EXPORTERS OF HIGH TEST,

Crystallized Black and Gray Oxides of  
MANGANESE.

Ground, granulated and especially prepared to suit all branches of the home trade. Warranted to contain from 70 to 90 per cent. peroxide of manganese, and to give satisfaction with regard to price and quality.

ALSO, MANUFACTURERS OF SUPERFINE FLOATED

## Standard Barytes.

Office, 214 Pearl Street, New York.

## JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,  
BUTCHERS' STEELS,  
AND  
SHOE KNIVES.

THE TRADE MARK, IN ADDITION  
TO THE NAME,  
IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY  
JOHN WILSON.



GRANTED A.D. 1766, BY THE  
CORPORATION OF CUTLERS OF SHEFFIELD,  
AND PROTECTED BY ACT OF PARLIAMENT.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

BUYERS ARE SPECIALLY CAUTIONED AGAINST  
IMITATIONS OF THE MARK, AND THE  
SUBSTITUTION OF COUNTERFEITS  
BEARING THE NAME, "WILSON," ONLY.

## HERMANN BOKER &amp; CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.

REMSCHIED and SOLINGEN (Prussia.) H. BOKER &amp; CO.

SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.

LIEGE (Belgium), Represented by Mr. LOUIS MULLER.

Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material.  
Proprietors of TRENTON VISE AND TOOL WORKS, Trenton, N. J.—Vises, Picks,  
Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.

Proprietors of the MANHATTAN CUTLERY CO., "O. K." Razors.

LAMSON &amp; GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher

Knives.

W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.  
Geo. Westenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.

John Wilson's Butcher and Shoe Knives.

Gardner's Pocket Knives. Trenton Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material,

Chains, Heavy Goods.

## The 1878 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED:



This machine presents all the advantages of a light and durable LAWN MOWER, and we believe has good qualities which cannot fail to be appreciated. It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.

Every machine warranted to work as represented.

## PRICE LIST.

Width of Cutter.	Description.	Price.
12 inch.	8 in. driving wheel, wt. 33½ lbs. Can be used by a lad.	each, \$18.00
14 "	8 in. driving wheel, wt. 34½ lbs. Can be used by a lady.	" 20.00
16 "	8 in. driving wheel, wt. 36½ lbs. One man size.	" 22.00

## GENERAL AGENTS:

LLOYD, SUPPLEE &amp; WALTON, 625 Market St., Philadelphia.

HORACE DURRIE &amp; CO., 97 Chambers &amp; 81 Reade Sts., N. Y.

BAEDER, ADAMSON & CO.,  
Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also, in Rolls for machine work.)

Ground Emery, Corundum &amp; Flint, Glue &amp; Curled Hair, Hair Felt, &amp; Felt-

ing for Covering Boilers, Pipes, &amp;c., Cow Hide Whips.

Stores: PHILADELPHIA, 730 Market St., NEW YORK, 67 Beckman St., BOSTON, 143 Milk St., CHICAGO, 152 Lake St.

## SPRING HINGES

WITH  
Patent Anti-Friction Springs,  
FOR  
SCREEN DOORS.

PRICE LIST.—Per Dozen Pairs.  
SINGLE JOINT HINGES.  
(To Swing one way.)

SIZE.	WITHOUT ACORN TIPS.		WITH ACORN TIPS.	
	BRASS.	NICKEL PLATED.	BRASS.	NICKEL PLATED.
2½ inch.	\$ 3 00	\$ 4 50	\$ 5 00	\$ 6 50
3 "	4 50	6 50	6 75	8 75
5 "	7 50	10 00	10 00	12 50
4½x4½ inch.	18 00	23 00	21 00	26 00

The 4½x4½ is Extra Heavy.

DOUBLE JOINT HINGES.  
(To Swing both ways.)  
To be used on Door 1 inch thick, or less.

SIZE.	WITHOUT ACORN TIPS.		WITH ACORN TIPS.	
	BRASS.	NICKEL PLATED.	BRASS.	NICKEL PLATED.
2½ inch.	\$ 6 60	\$ 9 00	\$11 50	\$14 25
3 "	8 30	11 50	13 50	17 00
5 "	16 50	21 00	21 50	26 00

The large cut represents full size of our 5 inch  
Double Joint Acorn Tip Hinge for mortising.  
The small cut represents the plain Single Joint  
Hinges, but not full size.

Liberal Discount to the Trade.

SCOVILL MFG. CO., Nos. 419 & 421 Broome Street,  
NEW YORK.

## The American Machine Co.,

MANUFACTURERS OF

And Other  
HARDWARE SPECIALTIES.

Office and Factory,

1916 to 1924 North Fourth Street, - - - PHILADELPHIA, PA.

## Automatic Revolving Scraper.



Iron or Steel Bottom.

Nothing equal to our Revolving Scraper for removing earth.

Also, Contractors' Plows and a full line of Barrows.  
Send for circular.

REVOLVING SCRAPER CO., Columbus, Ohio.

STEWART & MATTSON,  
Manufacturers of LOCKS, DOOR KNOBS AND FIRE-PROOF SAFES

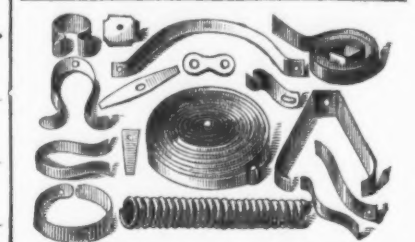
Remington Agricultural Co., Bushnell & Co.'s Wrought Staples, Jesse J.  
Collom's Black Augers, A. F. Whiting's Seal Car Locks.  
STORE, 513 Commerce St. FACTORY, Broad & Buttonwood Sts., Philadelphia.  
Agencies and consignments solicited.

## Emery, Grindstones, &amp;c.

Walter R. Wood,  
GRINDSTONES.Berea, O., Nova Scotia, & other brands,  
283 and 285 Front Street, New York.WORTHINGTON & SONS,  
North Amherst, Ohio.Lake Huron Amherst  
and Berea  
GRINDSTONES.

## H. S. WOOD &amp; CO.,

Manufacturers of  
Berea, O. New Castle, Eng.  
Black River, O. Wickerley, Eng.  
Lake Huron, Mich. Nova Scotia.

GRINDSTONES,  
33 West and 58 Washington Sts., N. Y.DUNBAR BROS.,  
Manufacturers of  
Clock Springs and Small Springs  
of every description, from best Cast Steel,  
BRISTOL, CONN.Wilson & Hughes Stone Co.,  
Quarriesmen.AMHERST BUILDING STONE,  
Buff and Light Drab Colors. Independence and Amherst  
Grindstones, for every variety of grinding. Ohio  
Fire-proof and Mineral Paints. Fire-proof Stove Putty.  
Orders promptly filled. CLEVELAND, O.Steam Oil Stone Works.  
F. E. DISHMAN,

Successor to Wm. GALBREATH & Co.  
Manufacturer and Dealer in the Best  
Washita, Arkansas, Hindostan and Sand  
STONES,

Of various sizes and patterns, suited to every  
variety of Mechanical use. New Albany, Ind.  
Send for price list.

BOYD & CHASE  
OIL STONE

The largest manufacturers in the world of  
Oil Stone  
Of all description.  
107th Street and Harlem River,  
Send for Illustrated Price List. NEW YORK.

"Bridgewater Iron Co.'s  
Horse Nails."

LIST PRICE, Pointed and Polished.

No. 5	6	7	8	9	10
26c.	23c.	21c.	20c.	19c.	18c.

Full Assortment of above always on hand

AND FOR SALE BY

THE PARKER MILLS,  
N. STETSON JR., Agent,  
73 Pearl St., New York.

## Coal.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

## A. PARDEE &amp; CO.

303 Walnut St.,  
PHILADELPHIA.

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

## Lehigh Coals.

The following superior and well known Lehigh  
Coals are mined by ourselves and firms  
connected with us, viz.

A. Pardee & Co. { HAZLETON,  
CRANBERRY,  
SUGAR LOAF.

Pardee, Bro. &amp; Co LATTIMER.

Calvin Pardee &amp; Co. HOLLYWOOD.

Pardee, Sons &amp; Co. Mt. PLEASANT.

## THE HOBOKEN COAL CO.,

Dealers in

SCRANTON, LEHIGH and other COALS.

Retail Yard on D. L. & W. Railroad, cor. Grove and  
10th Sts., Jersey City. Coal delivered direct from Shutes  
to Cars and Wagons. Families and manufacturers supplied  
with the best qualities of coal at the lowest rates.  
Offices: At Yard cor. Grove and 10th Sts.; cor. Bay  
St. and Newark Ave., Jersey City. Room 35, 111 Broad-  
way, N. Y. General Office, Bank Building, cor. Newark  
and Hudson Sts., Hoboken. P. O. Box 24, Hoboken.



**WHEELING HINGE CO.,**

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks,  
Hasps & Staples, Wrought Repair  
Links & Washers,

GRAHAM &amp; HAINES, Sole Agents, 113 Chambers &amp; 95 Reade Sts., N. Y.

**ENTERPRISE Mfg. CO. of PA.**

Patented Hardware Manufacturers and Iron Founders,  
THIRD and DAUPHIN Sts., PHILADELPHIA.



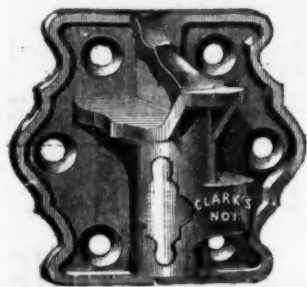
THE ENTERPRISE (not the Russian) S.A.D. IRON (Clad) Smoothing the Coast.  
**SPECIALTIES.**

Enterprise Patent Cold Handle Double Pointed  
SMOOTHING AND POLISHING IRONS,  
CHAMPION TOBACCO CUTTERS,  
PATENT MEASURING FAUCETS,  
SELF-WEIGHING CHEESE KNIVES,  
&c., &c.

**SPECIALTIES.**  
AMERICAN  
COFFEE, SPICE AND DRUG MILLS  
SAUSAGE STUFFERS,  
FRUIT, LARD AND JELLY PRESSES,  
CHAMPION DRIED BEEF SHAVERS,  
Coffee Roasters, Bung-Hole Borers,  
&c., &c.

**CLARK & CO.,**

MANUFACTURERS OF

**BUILDERS' HARDWARE.**

426 and 428 Niagara Street,  
BUFFALO, N. Y.

TENNIS & WILSON, Agents,  
Send for Catalogue and Price List.

81 Beekman Street, New York.

**"FELTER'S PATENT LOCKS,"**

MANUFACTURED BY

The American Lock Mfg. Co.,  
Are the most **SECURE** and **DURABLE** ever made.

**SECURE**  
Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the lock from being opened unless brought to proper position by the Key.

**DURABLE**  
Because we use no Springs to break or get out of place.

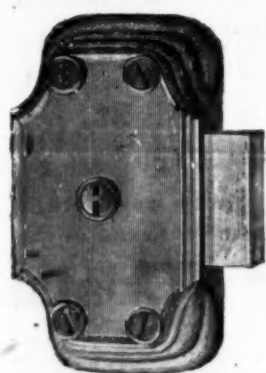


THEY HAVE  
**STERLING METAL KEYS**

That will not corrode or wear, and are  
stronger than steel.

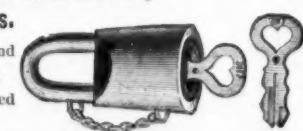


FULL SIZE OF KEY.



Upright Rim Dead Locks,  
Horizontal Rim Night Latches,  
Horizontal Rim Tubular Night Latches,  
Mortise Night Latches, Plain Fronts,  
Mortise Night Latches, Ornamental Bronze  
Fronts and Knobs,  
Brass Chest, Box, Cupboard and  
Drawer Locks,  
Solid Bronze Padlocks.

Illustrated Catalogue and  
Price List sent on application.  
All orders should be addressed  
to



UNION NUT CO., General Agents, 99 Chambers St., N. Y.

Mica and Porcelain Materials.

**THE CHESTER MICA AND PORCELAIN CO.**

OFFER

Mica of the Best Quality,  
Feldspar of highest Standard and Purity,  
Quartz, the Finest, Whitest, Best.  
Kaolin, Asbestos and Baryta.  
Best Terms, Wholesale and Retail.

Address, CHESTER MICA AND PORCELAIN CO., 87 Liberty St., New York.

Established in 1839.

A. G. COES &amp; CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

**SCREW WRENCHES.**

Our goods have been very  
much improved recently, by  
making the Bar WIDE, as  
shown in the cut, which makes  
a 12 in. Wrench as strong as a  
15 in. made in the ordinary way,  
and by using

A. G. COES'

NEW PATENT

**FERRULE**Which cannot be forced back  
into the handle.

Our goods are manufac-  
tured under Patents dated Feb-  
ruary 7, 1860, (re-issued June  
20, 1871), May 2, 1871, and Dec.  
26, 1871, and any violation of  
either will be vigorously prose-  
cuted.

We call particular attention to our  
new Patent Ferrule, with its support-  
ing Nut (shown in section in the above  
cut), which makes the strongest Ferrule  
fastening known.

A. G. COES &amp; CO.

Our Agents, GRAHAM & HAINES, 113 Chambers St.  
New York, carry a full line of our goods, and will be  
pleased to serve you at factory prices.

**N. Y. MALLET and HANDLE WORKS**

Manufacturers of  
Calkers', Carpenters', Stone Cutters'  
Tin, Copper and Boiler Makers'  
**MALLETS,**

Hawking Beets, Hawking and Calking Irons,  
also all kinds of Handles, Sledge, Chisel and Hamme.  
Handles. Also

**COTTON AND RALE HOOKS,**  
Patented Feb. 12, 1871; a new combination of Hooks.  
456 E. Houston St., New York City.

**Wilson Bohannan,**

Manufacturer of Patent

**BRASS Pad Locks,**

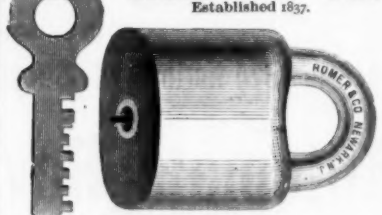
FOR  
Railroad Switches, Freight Cars,  
and the Hardware Trade.  
All sizes, with Brass and Steel  
Keys, with & without chains.  
Passenger Car Locks,  
Bronzed, Nickel-Plated and  
Japanned.

**Patent Tubular Night Latches.**

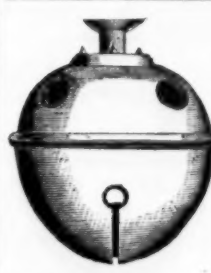
Will answer for Doors from 1 1/4 to 2 inches.

BROOKLYN, N. Y.

Catalogues and Samples sent upon application.



Manufacturers of Patent Scandinavian or Jail  
Locks, Brass Pad Locks for Railroads and Switches.  
Also Patent Stationary R. R. Car Door Locks. Pat-  
ent Piano and Sewing Machine Locks.  
141 to 145 Railroad Avenue, NEWARK, N. J.  
Illustrated Catalogue sent to the trade on appli-  
cation.



Established 1838.

Bevin Bros. Mfg.  
Co.,

Easthampton, Ct.

Manufacturers of

**SLEIGH BELLS.**Horse, Tea, Hand,  
Gong Bell &c.

Bell Metal Kettles.

**COBB & DREW,**

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Com-  
mon and Swedes Iron, Leathered, Carpet, Lace and Glass  
Tacks: Finishing, Hungarian, Truck, Closet and Cigar  
Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

**George C. Grundy,**

HARDWARE.

165 Greenwich Street.

Agents for the Philadelphia Star Carriage and Tire Bolts.

**SAM'L G. B. COOK & CO.,**

American and Foreign

**Hardware and Cutlery Manufacturers' Agents,**

Nos. 5 &amp; 7 German St., - - BALTIMORE.

Represent and carry in stock a full line of the following manufacturers' goods, which we offer  
the Trade at manufacturers' prices and terms:

American Screw Co., Screws, Rivets,  
Tire Bolts, etc.  
American Tea Tray Co.  
American Machine Co., Crown Flu-  
ters, Wringers, etc.  
Branford Lock Works.  
Beardsley Scythe Co.  
Bailey Tool Co., Defiance Iron Planes.  
T. H. Bullock, Bellows.  
Carr, Crawley & Devlin, Building,  
Cabinet and Saddlery Hardware.  
Clark & Co., Patent Blind and Gate  
Hinges.  
Cowles Hardware Co., House Furnish-  
ing and other Hardware.  
Clark Bros. & Co., Carriage, Tire and  
other Bolts.  
Connecticut Cutlery Co., Pocket Cut-  
lery and Trimmers.  
H. Chapin's Son, Rules, Levels, etc.  
John Chatillon & Sons, Balances.  
L. Coes & Co., Patent Screw Wrenches.  
Eclipse Fan Blower.  
A. Field & Sons, Tacks, Nails, etc.  
Forsythe Scale Works, Scales and  
Wrought Goods.  
Hubbard, Bakewell & Co., Lippen-  
cott Axes and Shovels.  
Iowa Farming Tool Co., Handled  
Hoes and Rakes, Snaths, etc.

Kimball Shovel Co., Solid Cast Steel  
Shovels and Spades.  
Klein, Logan & Co., Picks, Mattocks,  
Grub Hoes, Fire Shovels, etc.  
Henry W. Kip, C. S. Hammers.  
Lancaster Bolt Co., Eagle Carriage  
and Tire Bolts.  
Lamson & Goodnow Mfg. Co., Table  
Cutlery, Butcher Knives, etc.  
Meriden Britannia Co., Plated Ware  
and Britannia Spoons.  
W. T. & J. Mersereau, Stair Rods, etc.  
Wm. McNeice, Saws.  
Nicholson File Co.,  
Saranac and International Horse  
Nails.  
Northwestern Horse Nail Co.  
Peck Bros. & Co., Brass Cocks.  
A. G. Patton, Enameled and Tinned  
Hollow Ware.  
Rogers Bros., "A1 1847" Plated Spoons,  
Forks, etc.  
Roy & Co., Strap and T and Hook and  
Eye Hinges, Wrought Butts, Nuts, Wash-  
ers, etc.  
Scandinavian Pad Locks.  
James R. Torrey's Razors and Straps.  
U. S. Lock Co., Shepherdston's Patent  
Locks.  
O. B. Wilson, Cow Bells.

And other manufacturers, making our assortment of

**Builders', Cabinet, Agricultural and House  
Furnishing Hardware & Cutlery.**

As complete as can be found in any house. Also full stock of  
Wostenholm's, Rodgers', Field & Co., Continental and German Cutlery,  
W. & S. Butcher's Razors, Edge Tools and Files.

**REVOLVERS AND CARTRIDGES.**

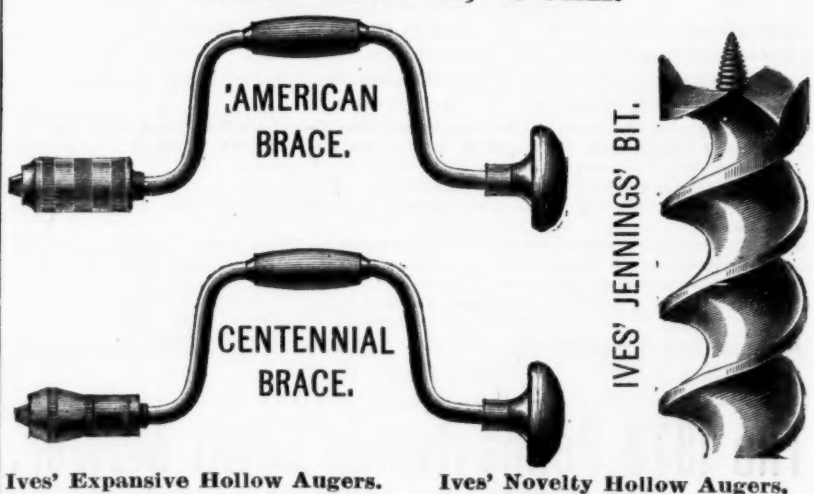
And a general assortment of  
**SHELF AND HEAVY HARDWARE.**

Orders filled promptly from stock.

Consignments of desirable goods solicited.

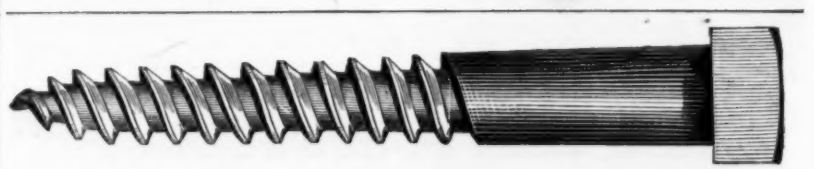
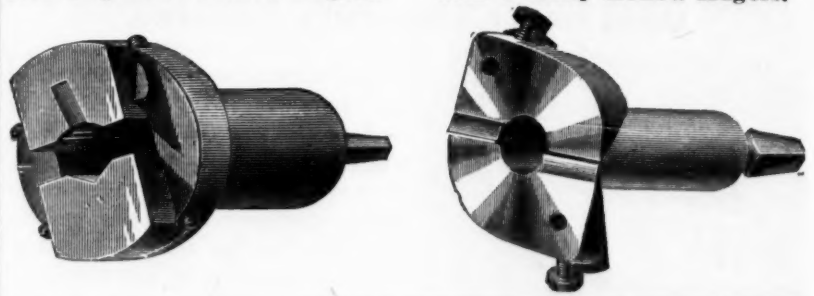
**WILLIAM A. IVES & CO.,**

New Haven, Conn.



Ives' Expansive Hollow Augers.

Ives' Novelty Hollow Augers.

**WM. H. HASKELL & CO.**

Pawtucket, R. I.,

MANUFACTURERS OF

**COACH SCREWS**

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,  
FORCED SET SCREWS,

AND

TAP BOLTS,









Bucket Pumper. **VALLEY MACHINE CO.** Acme Steam Pump.

**STEAM PUMP**

Manufacturers,

Wright's Patent. Easthampton, - Massachusetts. Mayher's Patent.

**Knowles' Patent Improved Mining Pumps.**

For draining COPPER, LEAD, GOLD, SILVER, IRON or COAL MINES.

AT THE CENTENNIAL EXHIBITION Five Medals of Honor were awarded these Pumps for superiority.

Arranged with Special Reference to Working Water Containing Dirt, Gritty Matter or Acid.

Pumps of capacity of over one million gallons per day are now delivering water through 600 feet vertical column, working entirely without shock or jar, the entire stoppages of Pump aggregating less than twelve hours per year.

ADDRESS

**Knowles' Steam Pump Works,**  
93 & 94 Libe

**The Eclipse Steam Pump.**

(Patented May 17, 1878.)

A New, Cheap and Simple Boiler Feeder.

This differs from any Pump of its class by doing away with a sliding box or strap, and supplying the places of the same by a hardened steel roller and steel pin. By this construction a great amount of friction is avoided. It is durable, handy and cheap. Anyone of ordinary intelligence can successfully operate it. Prices range from \$45 upwards.

Send for circular.

**M. SHULTZ,**  
No. 170 Plum Street, - CINCINNATI, OHIO.

**Chas. W. Ervien & Co.,**  
IRELAND ST.  
Kensington, PHILAD'A

**BUILDERS OF**  
**STATIONARY & MARINE**  
**ENGINES, BOILERS**  
**SHAFTING, GEARING,**  
**AND**  
**MILL WORK**  
GENERALLY.  
Special Machinery  
BUILT TO ORDER.

Vertical  
AND  
Horizontal  
**Engines,**  
Of new and Heavy Designs, from 2 to 100 H. P., on hand or in process of erection.

## FLORENCE OIL STOVES.



**Cook with Patent Top.**

THE ONLY SAFE, DURABLE AND

ODORLESS OIL STOVE

MADE.



**Double Cook.**

EXAMINE THIS AND BUY NO OTHER.

Liberal Discounts to the Trade.

SEND FOR CIRCULAR.



**No. 0 Cook.**

MANUFACTURED BY

## THE FLORENCE MACHINE COMPANY,

Florence, Mass.

PRINCIPAL OFFICES: 39 Union Square and 49 Murray Street, New York; 476 Washington St., Boston; 59 State St., Chicago; 1210 Ridge Ave., Philadelphia; 54 Wood St., Pittsburgh, Pa.; 67 Arcade, Providence, R. I.; 267 Middle St., Portland, Me.

### IRON AND STEEL DROP FORGINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders' and Plasterers' Tools, Saddlers' Round and Head Knives.

**WILLIAM ROSE & BROS.,**  
36th & Filbert Sts., West Philadelphia.

## L. M. RUMSEY & CO.,

SOLE OWNERS AND MANUFACTURERS OF

### Witherell's and Churchill's Patent RUBBER BUCKETS, PUMP CHAIN AND FIXTURES For Chain Pumps.



These Patents cover the use of the Rubber, the use of the Nut and Bolt for expanding, the use of the Tube and Valve for draining. All others are infringing, and manufacturers and dealers in infringing Buckets will be prosecuted to the full extent of the law.

For Rubber Buckets, Chain Tubing, Curbs and Fixtures, address

**L. M. RUMSEY & CO.,** 811 North Main Street, St. Louis, Mo., U. S. A.

### THE GRAHAM ADJUSTABLE STOVE PIPE.

(Pat. Jan. 9, 1877.)

Medal Awarded at American Institute, 1877.

**Sidney Shepard & Co.,**

Sole Manufacturers,  
BUFFALO, N. Y.

## THE EAGLE ANVIL!! WARRANTED!!



These Anvils are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more solid material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can therefore, be done on this Anvil with a 2/3 hammer one-fifth lighter than that required when using a wrought iron anvil.

The working surface is in one piece of Jessup's Best Tool Cast Steel, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The horn is covered with its extremity made entirely of steel. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1878. ANVILS weighing 100 lbs. to 500 lbs., 9c. per lb. Smaller Anvils, ("Minims.")

Weighting about 5 lb. 10 lb. 15 lb. 20 lb. 30 lb. 40 lb. 50 lb. 60 lb. 70 lb. 80 lb. 90 lb. \$2.25 \$2.75 \$3.25 \$3.75 \$4.25 \$4.75 \$5.25 \$5.75 \$6.25 \$6.75 \$7.25 \$7.75 \$8.25 \$8.75 \$9.25 \$9.75 \$10.25 \$10.75 \$11.25 \$11.75 \$12.25 \$12.75 \$13.25 \$13.75 \$14.25 \$14.75 \$15.25 \$15.75 \$16.25 \$16.75 \$17.25 \$17.75 \$18.25 \$18.75 \$19.25 \$19.75 \$20.25 \$20.75 \$21.25 \$21.75 \$22.25 \$22.75 \$23.25 \$23.75 \$24.25 \$24.75 \$25.25 \$25.75 \$26.25 \$26.75 \$27.25 \$27.75 \$28.25 \$28.75 \$29.25 \$29.75 \$30.25 \$30.75 \$31.25 \$31.75 \$32.25 \$32.75 \$33.25 \$33.75 \$34.25 \$34.75 \$35.25 \$35.75 \$36.25 \$36.75 \$37.25 \$37.75 \$38.25 \$38.75 \$39.25 \$39.75 \$40.25 \$40.75 \$41.25 \$41.75 \$42.25 \$42.75 \$43.25 \$43.75 \$44.25 \$44.75 \$45.25 \$45.75 \$46.25 \$46.75 \$47.25 \$47.75 \$48.25 \$48.75 \$49.25 \$49.75 \$50.25 \$50.75 \$51.25 \$51.75 \$52.25 \$52.75 \$53.25 \$53.75 \$54.25 \$54.75 \$55.25 \$55.75 \$56.25 \$56.75 \$57.25 \$57.75 \$58.25 \$58.75 \$59.25 \$59.75 \$60.25 \$60.75 \$61.25 \$61.75 \$62.25 \$62.75 \$63.25 \$63.75 \$64.25 \$64.75 \$65.25 \$65.75 \$66.25 \$66.75 \$67.25 \$67.75 \$68.25 \$68.75 \$69.25 \$69.75 \$70.25 \$70.75 \$71.25 \$71.75 \$72.25 \$72.75 \$73.25 \$73.75 \$74.25 \$74.75 \$75.25 \$75.75 \$76.25 \$76.75 \$77.25 \$77.75 \$78.25 \$78.75 \$79.25 \$79.75 \$80.25 \$80.75 \$81.25 \$81.75 \$82.25 \$82.75 \$83.25 \$83.75 \$84.25 \$84.75 \$85.25 \$85.75 \$86.25 \$86.75 \$87.25 \$87.75 \$88.25 \$88.75 \$89.25 \$89.75 \$90.25 \$90.75 \$91.25 \$91.75 \$92.25 \$92.75 \$93.25 \$93.75 \$94.25 \$94.75 \$95.25 \$95.75 \$96.25 \$96.75 \$97.25 \$97.75 \$98.25 \$98.75 \$99.25 \$99.75 \$100.25 \$100.75 \$101.25 \$101.75 \$102.25 \$102.75 \$103.25 \$103.75 \$104.25 \$104.75 \$105.25 \$105.75 \$106.25 \$106.75 \$107.25 \$107.75 \$108.25 \$108.75 \$109.25 \$109.75 \$110.25 \$110.75 \$111.25 \$111.75 \$112.25 \$112.75 \$113.25 \$113.75 \$114.25 \$114.75 \$115.25 \$115.75 \$116.25 \$116.75 \$117.25 \$117.75 \$118.25 \$118.75 \$119.25 \$119.75 \$120.25 \$120.75 \$121.25 \$121.75 \$122.25 \$122.75 \$123.25 \$123.75 \$124.25 \$124.75 \$125.25 \$125.75 \$126.25 \$126.75 \$127.25 \$127.75 \$128.25 \$128.75 \$129.25 \$129.75 \$130.25 \$130.75 \$131.25 \$131.75 \$132.25 \$132.75 \$133.25 \$133.75 \$134.25 \$134.75 \$135.25 \$135.75 \$136.25 \$136.75 \$137.25 \$137.75 \$138.25 \$138.75 \$139.25 \$139.75 \$140.25 \$140.75 \$141.25 \$141.75 \$142.25 \$142.75 \$143.25 \$143.75 \$144.25 \$144.75 \$145.25 \$145.75 \$146.25 \$146.75 \$147.25 \$147.75 \$148.25 \$148.75 \$149.25 \$149.75 \$150.25 \$150.75 \$151.25 \$151.75 \$152.25 \$152.75 \$153.25 \$153.75 \$154.25 \$154.75 \$155.25 \$155.75 \$156.25 \$156.75 \$157.25 \$157.75 \$158.25 \$158.75 \$159.25 \$159.75 \$160.25 \$160.75 \$161.25 \$161.75 \$162.25 \$162.75 \$163.25 \$163.75 \$164.25 \$164.75 \$165.25 \$165.75 \$166.25 \$166.75 \$167.25 \$167.75 \$168.25 \$168.75 \$169.25 \$169.75 \$170.25 \$170.75 \$171.25 \$171.75 \$172.25 \$172.75 \$173.25 \$173.75 \$174.25 \$174.75 \$175.25 \$175.75 \$176.25 \$176.75 \$177.25 \$177.75 \$178.25 \$178.75 \$179.25 \$179.75 \$180.25 \$180.75 \$181.25 \$181.75 \$182.25 \$182.75 \$183.25 \$183.75 \$184.25 \$184.75 \$185.25 \$185.75 \$186.25 \$186.75 \$187.25 \$187.75 \$188.25 \$188.75 \$189.25 \$189.75 \$190.25 \$190.75 \$191.25 \$191.75 \$192.25 \$192.75 \$193.25 \$193.75 \$194.25 \$194.75 \$195.25 \$195.75 \$196.25 \$196.75 \$197.25 \$197.75 \$198.25 \$198.75 \$199.25 \$199.75 \$200.25 \$200.75 \$201.25 \$201.75 \$202.25 \$202.75 \$203.25 \$203.75 \$204.25 \$204.75 \$205.25 \$205.75 \$206.25 \$206.75 \$207.25 \$207.75 \$208.25 \$208.75 \$209.25 \$209.75 \$210.25 \$210.75 \$211.25 \$211.75 \$212.25 \$212.75 \$213.25 \$213.75 \$214.25 \$214.75 \$215.25 \$215.75 \$216.25 \$216.75 \$217.25 \$217.75 \$218.25 \$218.75 \$219.25 \$219.75 \$220.25 \$220.75 \$221.25 \$221.75 \$222.25 \$222.75 \$223.25 \$223.75 \$224.25 \$224.75 \$225.25 \$225.75 \$226.25 \$226.75 \$227.25 \$227.75 \$228.25 \$228.75 \$229.25 \$229.75 \$230.25 \$230.75 \$231.25 \$231.75 \$232.25 \$232.75 \$233.25 \$233.75 \$234.25 \$234.75 \$235.25 \$235.75 \$236.25 \$236.75 \$237.25 \$237.75 \$238.25 \$238.75 \$239.25 \$239.75 \$240.25 \$240.75 \$241.25 \$241.75 \$242.25 \$242.75 \$243.25 \$243.75 \$244.25 \$244.75 \$245.25 \$245.75 \$246.25 \$246.75 \$247.25 \$247.75 \$248.25 \$248.75 \$249.25 \$249.75 \$250.25 \$250.75 \$251.25 \$251.75 \$252.25 \$252.75 \$253.25 \$253.75 \$254.25 \$254.75 \$255.25 \$255.75 \$256.25 \$256.75 \$257.25 \$257.75 \$258.25 \$258.75 \$259.25 \$259.75 \$260.25 \$260.75 \$261.25 \$261.75 \$262.25 \$262.75 \$263.25 \$263.75 \$264.25 \$264.75 \$265.25 \$265.75 \$266.25 \$266.75 \$267.25 \$267.75 \$268.25 \$268.75 \$269.25 \$269.75 \$270.25 \$270.75 \$271.25 \$271.75 \$272.25 \$272.75 \$273.25 \$273.75 \$274.25 \$274.75 \$275.25 \$275.75 \$276.25 \$276.75 \$277.25 \$277.75 \$278.25 \$278.75 \$279.25 \$279.75 \$280.25 \$280.75 \$281.25 \$281.75 \$282.25 \$282.75 \$283.25 \$283.75 \$284.25 \$284.75 \$285.25 \$285.75 \$286.25 \$286.75 \$287.25 \$287.75 \$288.25 \$288.75 \$289.25 \$289.75 \$290.25 \$290.75 \$291.25 \$291.75 \$292.25 \$292.75 \$293.25 \$293.75 \$294.25 \$294.75 \$295.25 \$295.75 \$296.25 \$296.75 \$297.25 \$297.75 \$298.25 \$298.75 \$299.25 \$299.75 \$300.25 \$300.75 \$301.25 \$301.75 \$302.25 \$302.75 \$303.25 \$303.75 \$304.25 \$304.75 \$305.25 \$305.75 \$306.25 \$306.75 \$307.25 \$307.75 \$308.25 \$308.75 \$309.25 \$309.75 \$310.25 \$310.75 \$311.25 \$311.75 \$312.25 \$312.75 \$313.25 \$313.75 \$314.25 \$314.75 \$315.25 \$315.75 \$316.25 \$316.75 \$317.25 \$317.75 \$318.25 \$318.75 \$319.25 \$319.75 \$320.25 \$320.75 \$321.25 \$321.75 \$322.25 \$322.75 \$323.25 \$323.75 \$324.25 \$324.75 \$325.25 \$325.75 \$326.25 \$326.75 \$327.25 \$327.75 \$328.25 \$328.75 \$329.25 \$329.75 \$330.25 \$330.75 \$331.25 \$331.75 \$332.25 \$332.75 \$333.25 \$333.75 \$334.25 \$334.75 \$335.25 \$335.75 \$336.25 \$336.75 \$337.25 \$337.75 \$338.25 \$338.75 \$339.25 \$339.75 \$340.25 \$340.75 \$341.25 \$341.75 \$342.25 \$342.75 \$343.25 \$343.75 \$344.25 \$344.75 \$345.25 \$345.75 \$346.25 \$346.75 \$347.25 \$347.75 \$348.25 \$348.75 \$349.25 \$349.75 \$350.25 \$350.75 \$351.25 \$351.75 \$352.25 \$352.75 \$353.25 \$353.75 \$354.25 \$354.75 \$355.25 \$355.75 \$356.25 \$356.75 \$357.25 \$357.75 \$358.25 \$358.75 \$359.25 \$359.75 \$360.25 \$360.75 \$361.25 \$361.75 \$362.25 \$362.75 \$363.25 \$363.75 \$364.25 \$364.75 \$365.25 \$365.75 \$366.25 \$366.75 \$367.25 \$367.75 \$368.25 \$368.75 \$369.25 \$369.75 \$370.25 \$370.75 \$371.25 \$371.75 \$372.25 \$372.75 \$373.25 \$373.75 \$374.25 \$374.75 \$375.25 \$375.75 \$376.25 \$376.75 \$377.25 \$377.75 \$378.25 \$378.75 \$379.25 \$379.75 \$380.25 \$380.75 \$381.25 \$381.75 \$382.25 \$382.75 \$383.25 \$383.75 \$384.25 \$384.75 \$385.25 \$385.75 \$386.25 \$386.75 \$387.25 \$387.75 \$388.25 \$388.75 \$389.25 \$389.75 \$390.25 \$390.75 \$391.25 \$391.75 \$392.25 \$392.75 \$393.25 \$393.75 \$394.25 \$394.75 \$395.25 \$395.75 \$396.25 \$396.75 \$397.25 \$397.75 \$398.25 \$398.75 \$399.25 \$399.75 \$400.25 \$400.75 \$401.25 \$401.75 \$402.25 \$402.75 \$403.25 \$403.75 \$404.25 \$404.75 \$405.25 \$405.75 \$406.25 \$406.75 \$407.25 \$407.75 \$408.25 \$408.75 \$409.25 \$409.75 \$410.25 \$410.75 \$411.25 \$411.75 \$412.25 \$412.75 \$413.25 \$413.75 \$414.25 \$414.75 \$415.25 \$415.75 \$416.25 \$416.75 \$417.25 \$417.75 \$418.25 \$418.75 \$419.25 \$419.75 \$420.25 \$420.75 \$421.25 \$421.75 \$422.25 \$422.75 \$423.25 \$423.75 \$424.25 \$424.75 \$425.25 \$425.75 \$426.25 \$426.75 \$427.25 \$427.75 \$428.25 \$428.75 \$429.25 \$429.75 \$430.25 \$430.75 \$431.25 \$431.75 \$432.25 \$432.75 \$433.25 \$433.75 \$434.25 \$434.75 \$435.25 \$435.75 \$436.25 \$436.75 \$437.25 \$437.75 \$438.25 \$438.75 \$439.25 \$439.75 \$440.25 \$440.75 \$441.25 \$441.75 \$442.25 \$442.75 \$443.25 \$443.75 \$444.25 \$444.75 \$445.25 \$445.75 \$446.25 \$446.75 \$447.25 \$447.75 \$448.25 \$448.75 \$449.25 \$449.75 \$450.25 \$450.75 \$451.25 \$451.75 \$452.25 \$452.75 \$453.25 \$453.75 \$454.25 \$454.75 \$455.25 \$455.75 \$456.25 \$456.75 \$457.25 \$457.75 \$458.25 \$458.75 \$459.25 \$459.75 \$460.25 \$460.75 \$461.25 \$461.75 \$462.25 \$462.75 \$463.25 \$463.75 \$464.25 \$464.75 \$465.25 \$465.75 \$466.25 \$466.75 \$467.25 \$467.75 \$468.25 \$468.75 \$469.25 \$469.75 \$470.25 \$470.75 \$471.25 \$471.75 \$472.25 \$472.75 \$473.25 \$473.75 \$474.25 \$474.75 \$475.25 \$475.75 \$476.25 \$476.75 \$477.25 \$477.75 \$478.25 \$478.75 \$479.25 \$479.75 \$480.25 \$480.75 \$481.25 \$481.75 \$482.25 \$482.75 \$483.25 \$483.75 \$484.25 \$484.75 \$485.25 \$485.75 \$486.25 \$486.75 \$487.25 \$487.75 \$488.25 \$488.75 \$489.25 \$489.75 \$490.25 \$490.75 \$491.25 \$491.75 \$492.25 \$492.75 \$493.25 \$493.75 \$494.25 \$494.75 \$495.25 \$495.75 \$496.25 \$496.75 \$497.25 \$497.75 \$498.25 \$498.75 \$499.25 \$499.75 \$500.25 \$500.75 \$501.25 \$501.75 \$502.25 \$502.75 \$503.25 \$503.75 \$504.25 \$504.75 \$505.25 \$505.75 \$506.25 \$506.75 \$507.25 \$507.75 \$508.25 \$508.75 \$509.25 \$509.75 \$510.25 \$510.75 \$511.25 \$511.75 \$512.25 \$512.75 \$513.25 \$513.75 \$514.25 \$514.75 \$515.25 \$515.75 \$516.25 \$516.75 \$517.25 \$517.75 \$518.25 \$518.75 \$519.25 \$519.75 \$520.25 \$520.75 \$521.25 \$521.75 \$522.25 \$522.75 \$523.25 \$523.75 \$524.25 \$524.75 \$525.25 \$525.75 \$526.25 \$526.75 \$527.25 \$527.75 \$528.25 \$528.75 \$529.25 \$529.75 \$530.25 \$530.75 \$531.25 \$531.75 \$532.25 \$532.75 \$533.25 \$533.75 \$534.25 \$534.75 \$535.25 \$535.75 \$536.25 \$536.75 \$537.25 \$537.75 \$538.25 \$538.75 \$539.25 \$539.75 \$540.25 \$540.75 \$541.25 \$541.75 \$542.25 \$542.75 \$543.25 \$543.75 \$544.25 \$544.75 \$545.25 \$545.75 \$546.25 \$546.75 \$547.25 \$547.75 \$548.25 \$548.75 \$549.25 \$549.75 \$550.25 \$550.75 \$551.25 \$551.75 \$552.25 \$552.75 \$553.25 \$553.75 \$554.25 \$554.75 \$555.25 \$555.75 \$556.25 \$556.75 \$557.25 \$557.75 \$558.25 \$558.75 \$559.25 \$559.75 \$560.25 \$560.75 \$561.25 \$561.75 \$562.25 \$562.75 \$563.25 \$563.75 \$564.25 \$564.75 \$565.25 \$565.75 \$566.25 \$566.75 \$567.25 \$567.75 \$568.25 \$568.75 \$569.25 \$569.75 \$570.25 \$570.75 \$571.25 \$571.75 \$572.25 \$572.75 \$573.25 \$573.75 \$574.25 \$574.75 \$575.25 \$575.75 \$576.25 \$576.75 \$577.25 \$577.75 \$578.25 \$578.75 \$579.25 \$579.75 \$580.25 \$580.75 \$581.25 \$581.75 \$582.25 \$582.75 \$583.25 \$583.75 \$584.25 \$584.75 \$585.25 \$585.75 \$586.25 \$586.75 \$587.25 \$587.75 \$588.25 \$588.75 \$589.25 \$589.75 \$590.25 \$590.75 \$591.25 \$591.75 \$592.25 \$592.75 \$593.25 \$593.75 \$594.25 \$594.75 \$595.25 \$595.75 \$596.25 \$596.75 \$597.25 \$597.75 \$598.25 \$598.75 \$599.25 \$599.75 \$600.25 \$600.75 \$601.25 \$601.75 \$602.25 \$602.75 \$603.25 \$603.75 \$604.25 \$604.75 \$605.25 \$605.75 \$606.25 \$606.75 \$607.25 \$607.75 \$608.25 \$608.75 \$609.25 \$609.75 \$610.25 \$610.75 \$611.25 \$611.75 \$612.25 \$612.75 \$613.25 \$613.75 \$614.25 \$614.75 \$615.25 \$615.75 \$616.25 \$616.75 \$617.25 \$617.75 \$618.25 \$618.75 \$619.25 \$619.75 \$620.25 \$620.75 \$621.25 \$621.75 \$622.25 \$622.75 \$623.25 \$623.75 \$624.25 \$624.75 \$625.25 \$625.75 \$626.25 \$626.75 \$627.25 \$627.75 \$628.25 \$628.75 \$629.25 \$629.75 \$630.25 \$630.75 \$631.25 \$631.75 \$632.25 \$632.75 \$633.25 \$633.75 \$634.25 \$634.75 \$635.25 \$635.75 \$636.25 \$636.75 \$637.25 \$637.75 \$638.25 \$638.75 \$639.25 \$639.75 \$640.25 \$640.75 \$641.25 \$641.75 \$642.25 \$642.75 \$643.25 \$643.75 \$644.25 \$644.75 \$645.25 \$645.75 \$646.25 \$646.75 \$647.25 \$647.75 \$648.25 \$648.75 \$649.25 \$649.75 \$650.25 \$650.75 \$651.25 \$651.75 \$652.25 \$652.75 \$653.25 \$653.75 \$654.25 \$654.75 \$655.25 \$655.75 \$656.25 \$656.75 \$657.25 \$657.75 \$658.25 \$658.75 \$659.25 \$659.75 \$660.25 \$660.75 \$661.25 \$661.75 \$662.25 \$662.75 \$663.25 \$663.75 \$664.25 \$664.75 \$665.25 \$665.75 \$666.25 \$666.75 \$667.25 \$667.75 \$668.25 \$668.75 \$669.25 \$669.75 \$670.25 \$670.75 \$671.25 \$671.75 \$672.25 \$672.75 \$673.25 \$673.75 \$674.25 \$674.75 \$675.25 \$675.75 \$676.25 \$676.75 \$677.25 \$677.75 \$678.25 \$678.75 \$679.25 \$679.75 \$680.25 \$680.75 \$681.25 \$681.75 \$682.25 \$682.75 \$683.25 \$683.75 \$684.25 \$684.75 \$685.25 \$685.75 \$686.25 \$686.75 \$687.25 \$687.75 \$688.25 \$688.75 \$689.25 \$689.75 \$690.25 \$690.75 \$691.25 \$691.75 \$692.25 \$692.75











Machinery, &c.

THE JUDSON GOVERNOR.

It is a common method to advertise Governors without cost, unless satisfactory to the customer, and then charge High Prices for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in accuracy and durability—the main essentials—we guarantee it shall do more.

Reduced Price List, FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.



THE JUDSON PATENT

Improved Steam Governor.

No Charge for Boxing or Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

Size, Inch.	Plain.	Bright Finish.	Extra for Speed.	Stop Valve.
1/2	\$16.00	\$18.00	\$1.00	....
3/4	18.00	20.00	1.00	....
1	20.00	22.00	2.00	\$5.00
1 1/4	23.00	25.00	2.25	6.00
1 1/2	25.00	27.00	2.50	8.00
1 3/4	31.00	33.00	2.75	10.00
2	36.00	38.00	3.25	12.00
2 1/4	40.00	42.00	3.50	14.00
2 1/2	45.00	47.00	3.75	16.00
2 3/4	50.00	52.00	4.25	18.00
3	59.00	61.00	4.50	23.00
3 1/4	69.00	71.00	5.00	28.00
3 1/2	80.00	82.00	5.50	34.00
3 3/4	90.00	92.00	6.00	40.00
4	105.00	107.00	6.50	46.00
4 1/4	120.00	122.00	7.00	54.00
4 1/2	142.00	144.00	8.00	65.00
4 3/4	175.00	177.00	9.00	79.00
5	198.00	200.00	10.00	....
5 1/2	210.00	212.00	12.00	....

PRESSES, DROP HAMMERS, DIES, And Other Tools

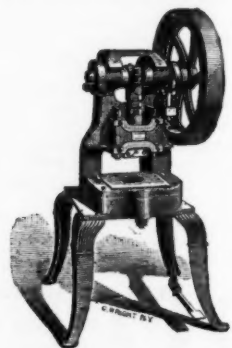
FOR THE MANUFACTURE OF ALL KINDS OF

Sheet Metal Goods, DROP FORGINGS, &c.

The Stiles & Parker Press Co., MIDDLETOWN, CONN.

BLISS & WILLIAMS,

Manufacturers of all kinds of



Presses, Dies and Special Machinery

FOR WORKING SHEET METALS, &c.

Fruit and other Can Tools.

167 to 173 Plymouth St., corner of Jay, Brooklyn, N. Y., and Paris Exposition, 1878.

"TRENTON" RAPID TRANSIT VISES.

Pat. Nov. 1st, 1870; Feb. 12th, 1877.

PARALLEL.

Swivel and Coachmakers' VISES.

The Best Rapid Adjustable Vise in the Market.

Simple and durable. No chance of getting out of order. No toggle or cam movements or parts. A trial will convince.

TRENTON VISE & TOOL WORKS, Trenton, N. J.

HERMANN BOKER & CO., Proprietors, 101 & 103 Duane Street, NEW YORK.

BEECHER & PECK,

Successors to Milo Peck (deceased), Manufacturers of

PECK'S DROP PRESS

Newspaper Directing Machines, &c.

Special attention given to the making of all Drop Dies.

Special Machinery fitted up to order.

NEW HAVEN, CONN.

Machinery, &c.

Established 1848.

WM. SELLERS & CO.,

600 Hamilton Street, PHILADELPHIA,

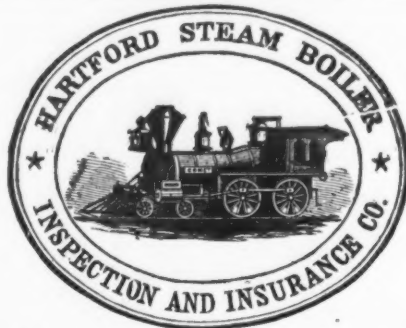
Engineers, Iron Founders and Machinists. RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters Are of Improved and Patented Construction.

Railway Turning and Transfer Tables, SHAFTING & MILL GEARING, a specialty.

Pivot Bridges.

GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.



Issues Policies of Insurance after a careful inspection of the Boilers.

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery.

ARISING FROM,

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

Board of Directors:

J. M. ALLEN, President. LUCIUS J. HENDEE, Pres't of Fire Ins. Co. FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silk Manufacturing Co. CHARLES M. BEACH, of Beach & Co. DANIEL PHILLIPS, of Adams Express Co. GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank. RICHARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co. THOMAS O. ENDERS, Sec'y Fina Life Ins. Co. LEVERETT BRAINARD, of Case, Lockwood & Brainard. GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fire Arms Mfg. Co. GEO. CROMPTON, Crompton Loom Works, Worcester WILLIAM ADAMSON, of Reader, Adamson & Co., Philadelphia. HON. THOS. TALBOT, Ex-Governor of Mass. NEWTON CASE, Case, Lockwood & Brainard, Hartford WILLIAM S. SLATER, Cotton Manufacturer, Providence, R. I. NELSON HOLLISTER, of State Bank, Hartford. D. R. SMITH, Pres't Springfield Fire & Marine Ins. Co.



A. J. DAVIS & CO., Patent Friction Hoisting Engines

For Mines, Quarries, Dock Building &c.

MANUFACTURERS OF

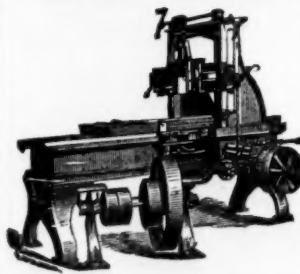
SHAPERS, DRAIN PIPE MACHINES, BAG AND SACHEL MACHINERY, Steam Engines, Wire Drawing Machinery, &c., &c.

69 N. J. R. R. Avenue, Newark, N. J. Correspondence solicited.

The Pratt & Whitney Co., Hartford, Conn.,

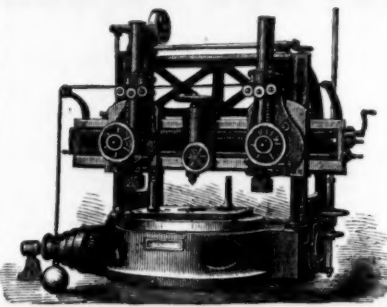
Have constantly on hand and making

Drop Hammers



Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

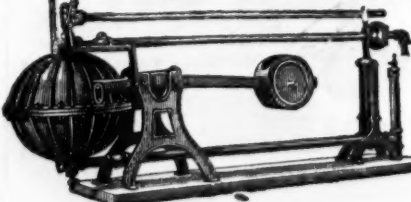
BORING AND TURNING MACHINES.



Special Pulley Turning Machinery, Engine Lathes, Iron Planers, Universal Radial Drilling Machines, Hydrostatic Presses, Car Axle Lathes and Wheel Bore. Latest designs and patterns. Prices very reasonable.

NILES TOOL WORKS, Hamilton, Ohio.

The Albany Steam Trap.

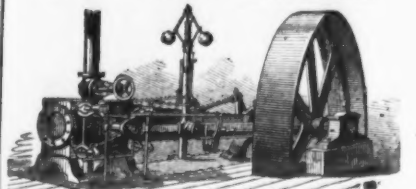


This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

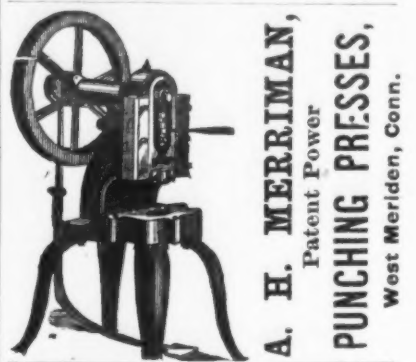
Albany Steam Trap Company, Albany, N. Y.

Machinery, &c.

Corliss Engine Builders, With Wetherill's Improvements.



Engineers, Machinists, Iron Founders and Boiler Makers. ROBT. WETHERILL & CO. Chester Pa.



A. H. MERRIMAN, Patent Power PUNCHING PRESSES, West Meriden, Conn.

JOSEPH C. TODD, Engineer & Machinist

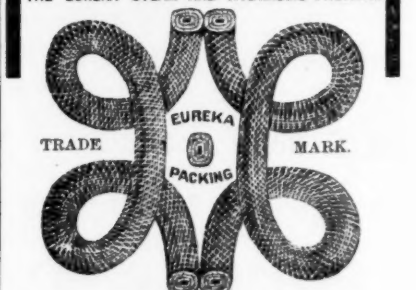
Flax, Hemp, Jute, Rope, Oakum and Bagging Machinery, Steam Engines, Boilers, etc.

I also manufacture BAXTER'S New Portable Engine of 1877, of one horse-power, complete for \$125.

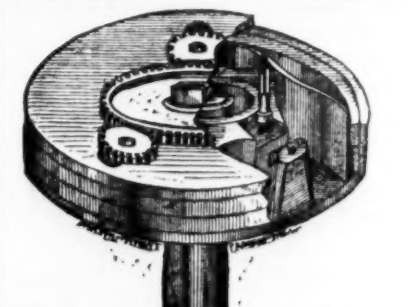
2 Horse Power.....\$225 1200  
3 1/2 Horse Power.....\$350 1700  
5 Horse Power.....\$475 2100  
Can be seen in operation at my store. Send for descriptive circular and price. Address J. C. TODD, 10 Barclay St., N.Y., or Paterson, N. J.



True Merit and Excellence is the Basis of all Success. THE EUREKA STEAM AND HYDRAULIC PACKING.



SYMMONS & CO., 120 Exchange Place, Phila., Sole Manufacturers. The results of a long series of experiments made with a view of meeting all the requirements of a Perfect Packing. And we assert without reservation that it is the best article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of braids of linen, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, bite or gum the rods, no matter how long run. It has thus far received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled. Wickesham & Co., sole Agents, 59 S. Fourth St., Philadelphia.



WM. SPRAGUE & CO.,

Manufacturers of Sprague's Improved Steam Engine and Pump Pistons.

Guaranteed to save 10 per cent. over any now in use. Special attention given to repairing, improving, &c. Send for circular and price list. 628 and 630 Filbert St., Philadelphia.

MEDAL and PREMIUM Awarded to

T. C. ALCOTT & SON, Mount Holly, N. J. For their Improved Turbine Water Wheels.



## TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.  
PAUL S. REEVES,  
MANUFACTURER OF

### ANTI-FRICTION METALS.

XXX Gentile.....	35c	C.....	17c
XX.....	30c	D.....	15c
X.....	25c	E.....	13c
A.....	20c	F.....	10c
B.....	15c		

"Note."—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

INGOT BRASS. | OLD METALS AND TURNINGS WANTED. | BRASS CASTINGS.

ESTABLISHED 1842.

## WM. & HARVEY ROWLAND PHILADELPHIA,

P. O. Address: Frankford, Philad'a. } MANUFACTURERS OF ALL KINDS OF

## Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND FLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.  
BESSEMER SHOVEL AND FLOW STEEL.  
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

F. B. GRIFFIN.

C. E. JENNINGS.

## C. E. JENNINGS & CO.,

No. 98 Chambers Street, - NEW YORK.

OFFICE OF AND AGENTS FOR

E. H. TRACY, Proprietor J. L'Hommedieu Ship Auger Works.

These celebrated Augers have been in the market since 1818. Their reputation for hard wood boring for railroad use and bridge building is well known to the trade.

WATROUS & CO., Ship Augers and Bits.

Established in 1844. The quality and reputation of these goods stand the same as the L'Hommedieu.

WATROUS & CO., Patent Adjustable Handle Drawing Knives.

Commenced making these goods in 1857.

GILLET & CO., Proprietors of Nobles Mfg. Co., Bits and Augers

of all kinds. Established in 1844 at Ravenna, Ohio, and 1863 at Elmira, New York.

GEO. S. WILDER, Proprietor of P. Merrill's Chisels & Drawing Knives.

Established 1847.

H. H. MAYHEW & CO., Shepardson's Double Cut Gimlet Bits, Etc.

The first Double Cut Gimlet Bits made in America in their shop, 1855.

BENJAMIN PIERCE, Auger Bits and Car Bits.

Special attention paid to Machine Bits.

PHILLIPS MFG. CO., Patent Boring Machines.

C. L. JEFFORDS, Axes and Edge Tools.

Established 1834.

J. T. PAINES, Patent Solid Head Auger and Machine Bits.

We will have our Illustrated List of Tools and other goods ready for distribution July 1st.

## IMPROVED STEEL CASTINGS.

Under Hainsworth's Patents.

We make Castings practically free from blow-holes, of steel which is as soft and as easily WORKED and WELDED as Wrought Iron, yet is STIFF, STRONG and DURABLE, with a TENSILE STRENGTH of not less than 65,000 lbs. to the square inch. In short, OUR CASTINGS UNITE THE QUALITIES OF STEEL AND WROUGHT IRON.

Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.

WE USE NO CAST IRON.

Send for circular.

PITTSBURGH STEEL CASTING CO.,  
PITTSBURGH, PA.



J. M. CARPENTER,  
PAWTUCKET, R. I.

Manufacturer of Machinists' Hand, Machine or Nut, Blacksmiths' Taper, Gas and Steam Fitters' TAPS; also MACHINE SCREW TAPS, (American Screw Co. Standard), Steam & Gas Fitters' Stocks & Dies, Screw Plates and Dies and Solid Bolt Dies. Send for price list.

The Reading Bolt & Nut Works. J. H. Sternbergh, Reading, Pa., U. S. A.  
Manufacturer of a Superior Quality of

MACHINE BOLTS, HOT PRESSED NUTS,

Railroad Track Bolts, Boiler and Bridge Rivets, Bolt Ends, Washers, Wood Screws, Turnbuckles, Refined Bar Iron, Etc., Etc., Etc.

STANLEY G. FLAGG & CO.  
PHILADELPHIA, PA.  
Office and Warehouse,  
No. 216 & 218 N. THIRD ST.  
Manufacturers of

## STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.  
17" Circulars sent on application. 41

## STEEL CASTINGS

From 1/4 to 10,000 lbs. weight, solid, and true to pattern, of a times the strength of cast iron. Invaluable for Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 12,000 Crank Shafts of this steel now running proved superior to wrought iron. Circulars and price lists free. Address CHESTER STEEL CASTINGS CO., Eveleth St., Philadelphia, Pa.

## Steel Castings,

Light and heavy Steel Castings of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

EUREKA CAST STEEL CO.,  
Chester, Pa.  
Office: 307 Walnut St., Phila.

## DIAMOND



## LANTERN.

R. E. DIETZ,  
54 & 56 Fulton St., N. Y.,  
Manufacturer of

TUBULAR LANTERNS,

"Catch-em-Alive" Mouse Traps,  
Mill Machinery For Sale.

### FOR SALE.

A complete set of Zinc Rolling Machinery, consisting of three sets of chilled rolls, with stands, bed plates, pinions, couplings, etc., the whole well adapted to sheet metal rolling. The stands and bed-plates would be applicable to rail or other heavy iron rolling.

Offers for the whole or part of this machinery will be received by

WM. ALLEN SMITH,  
Ansonia, Conn.



Warranted the best Article in the Market.

MANUFACTURED ONLY BY

D. ARTHUR BROWN & CO., Fisherville, N. H.



## DRILL PRESS.

From New Patterns.

NEW IMPROVEMENTS

STRONG AND POWERFUL.

Cost One-third Less than

any Drill in the Market.

SEND FOR CIRCULAR.

H. BICKFORD,  
CINCINNATI, O.



Machines AND Wheels Guaranteed.

Send for

Illustrated

Circular

and Prices.

Weissport,

PA.

VOLNEY W. MASON & CO.,

Manufacturers of Patent

Friction Pulleys,

FRICION CLUTCHES

For connecting Shafting and Gearing.

Hoisting Machinery & Elevators, Shafting,

Hangers and Gearing.

Lafayette Street, PROVIDENCE, R. I.

See cut of Elevator Hoisting Machine in issue of July 18, 1876, page 40.

PATTERNS, MODELS

and Experimental Machinery of every descrip-

tion, made by

WM. BURROWS, 90 Fulton St., N. Y.

Scranton Brass Works,

J. M. EVERHART

Manufacturer of

BRASS WORK,

For Water, Gas & Steam. Also

Car & Wilcox Patent Cut Files.

Will cut faster, wear longer, and clog less than any file in market.

ONE Street, SCRANTON, PA.

## Russell, Burdsall & Ward, PORT CHESTER, N. Y.

Manufacturers of

Carriage, Tire, Plow, Stove  
AND OTHER

## BOLTS.

Carriage Bolts made from Best Square Iron a Specialty.

## JOHN RUSSELL CUTLERY CO.,

Green River Works,

MANUFACTURERS OF

## Table and Pocket Cutlery,

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

FIRST HOME MANUFACTURERS.

New York Office,

Factories,

90 Chambers Street.



Turners Falls, Mass.

## E. M. BOYNTON,

Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c. Also Sole Proprietor and Manufacturer of the Genuine Patent Lightning Saw.

80 BECKMAN STREET, NEW YORK.

### TRIAL OF THE IMPROVED LIGHTNING SAW.

The Emperor Dom Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall, at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed a trial of the New Lightning Saw, patented March 26, 1876. Two men, with one of these saws, cut off a sound log of gum-wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corliss, Morell, Lynch, and other members of the commission, witnessed the trial and timed the cutting. The Emperor remarked, That was fast, very fast cutting. Last evening the Emperor made another examination of the saw.—Philadelphia Press, June 30.

"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chairman of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

Received Medal and Highest Award of Centennial World's Fair, 1876. \$1000 Challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.

## "SHOO-FLY"

## Screen Door Springs,

QUALITY

EXCELLENT.



PRICES

VERY LOW.

## Van Wagoner & Williams,

MANUFACTURERS,

82 Beekman Street, New York.